

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED (IHCYCLE) WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS



M.Sc., FOOD SERVICE MANAGEMENT AND DIETETICS

SYLLABUS

2023-2024 and Onwards



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18
DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS

M.Sc., FOOD SERVICE MANAGEMENT AND DIETETICS
LEARNING OUTCOME BASED CURRICULUM FRAME WORK (CBCS-LOCF)
(For the Candidates admitted from the Academic year 2023-2024 onwards)

Semester I

Semester	Course	Course Title	Course Code	Inst. Hrs. /week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course -I(CC)	Food Service Management	23PFS1CC1	6	5	3	25	75	100
	Core Course –II(CC)	Food Science	23PFS1CC2	6	5	3	25	75	100
	Core Course–III(CC)	Human Physiology	23PFS1CC3	6	5	3	25	75	100
	Core Practical-I(CP)	Food Science (P)	23PFS1CC1P	6	5	3	40	60	100
	Discipline Specific Elective Course-I(DSE)	A. Food Microbiology, Safety and Quality Control	23PFS1DSE1A	6	3	3	25	75	100
		B. Nutrition Through Life Cycle	23PFS1DSE1B						
		C.Front Office Operations	23PFS1DSE1C						
	Total			30	23				500

Semester II

Semester	Course	Course Title	Course Code	Inst. Hrs. /week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
II	Core Course -IV(CC)	Public Health Nutrition	23PFS2CC4	6	5	3	25	75	100
	Core Course – V (CC)	Advanced Dietetics	23PFS2CC5	6	5	3	25	75	100
	Core Choice Course -I (CCC)	A. Biochemistry and Metabolic Disorders	22PFS2CCC1A	6	4	3	25	75	100
		B. Food Quality Control and Regulations	22PFS2CCC1B						
		C. Nutrition in Clinical Critical Care	23PFS2CCC1C						
	Core Practical-II(CP)	Advanced Dietetics (P)	23PFS2CC2P	6	5	3	40	60	100
	Discipline Specific Elective Course- II (DSE)	A. Functional Foods, Nutraceuticals and Nutrigenomics	22PFS2DSE2A	6	3	3	25	75	100
		B. House Keeping and Interior Designing	22PFS2DSE2B						
		C. Food Packaging	22PFS2DSE2C						
	Internship	Internship	22PFS2INT	-	2	-	40	60	100
	Extra Credit Course	SWAYAM ONLINE COURSE		As per UGC Recommendation					
	Total			30	24				600

Semester III

Sem	Course	Course Title	Course Code	Inst. Hrs. /week	Credits	Exam			Total
						Hrs	Marks		
							Int	Ext	
III	Core Course -VI (CC)	Food Product Development and Entrepreneurship	22PFS3CC6	6	5	3	25	75	100
	Core Course – VII (CC)	Research Methods, Statistical Techniques and Computer Applications	22PFS3CC7	6	5	3	25	75	100
	Core Choice Course– II (CCC)	A. Cyber Security	22PGCS3CCC2A	5	4	3	25	75	100
		B. Food Preservation	23PFS3CCC2B						
		C. Food Service Facilities	22PFS3CCC2C						
	Core Practical - III (CP)	Research Methods, Statistical Techniques and Computer Applications (P)	23PFS3CC3P	5	4	3	40	60	100
	Discipline Specific Elective Course-III (DSE)	A. Competitive Examinations in Home Science for Professional Development	22PFS3DSE3A	5	3	2	-	100	100
		B. Waste Management in Food Industries	22PFS3DSE3B			3	25	75	
		C. Child Development	22PFS3DSE3C						
	Generic Elective Course-I (GEC)	Fundamentals of Nutrition	22PFS3GEC1	3	2	3	25	75	100
Extra Credit Course	SWAYAM ONLINE COURSE	As per UGC Recommendation							
Total				30	23				600

Semester – IV

Sem	Course	Course Title	Course Code	Inst. Hrs.	Credits	Exam			Total
						Hrs	Marks		
							Int	Ext	
IV	Core Course – VIII (CC)	Quantity Food Production and Service	22PFS4CC8	6	5	3	25	75	100
	Core Choice Course– III (CCC)	A. Management and Accounting in Hospitality Industry	22PFS4CCC3A	6	4	3	25	75	100
		B. Techniques in Food Analysis	22PFS4CCC3B						
		C. Dietary Compliance and Counselling Skills	22PFS4CCC3C						
	Core Practical - IV (CP)	Quantity Food Production and Service (P)	22PFS4CC4P	6	5	3	40	60	100
	Generic Elective Course-II (GEC)	Community Nutrition	22PFS4GEC2	3	2	3	25	75	100
	Project	Project Work	23PFS4PW	9	4	-	-	100	100
	Total			30	20				500
	Grand Total			120	90				2200

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS

VISION

To strengthen and integrate academic excellence, ethical values and social responsibility to develop a healthy nation by imparting skill based knowledge, professional competency and entrepreneurial skills.

MISSION

- To have a breadth of knowledge across the subject areas of Nutrition and Dietetics.
- To professionally enrich the students for successful career in Academia, Industry and Research.
- To promote and inculcate self-reliance, social relevance, sound value system and code of professional practice among students.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR
M.Sc., FOOD SERVICE MANAGEMENT AND DIETETICS PROGRAMME

PO NO	On completion of M.Sc., Programme, the students will be able to
PO1	SCIENTIFIC MANAGEMENT AND CAREER OPPORTUNITIES Master the scientific and applied aspects of the subject for employment opportunities.
PO2	EXPLORE CREATIVITY AND INTELLIGENCE Employ novel ideas with conceptual thinking to secure self-discipline and independence to foster scientific attitude by exploration of science.
PO3	TEAM BUILDING AND SCIENTIFIC TEMPERAMENT Inculcate training, internships and team spirit with leadership skills through academic projects and transmit complex scientific and technical information and contribute to the scientific community.
PO4	INNOVATIVE LEARNING AND TECHNOLOGICAL ADVANCEMENT Perceive research in the specialized areas and to engage in life-long learning to keep pace with emerging trends in academics, research and technology.
PO5	PERSONALITY DEVELOPMENT WITH SOCIAL RESPONSIBILITY Achieve ethical, social and holistic values with social responsibility to develop a healthy life.

PROGRAMME SPECIFIC OUTCOMES FOR
M.Sc., FOOD SERVICE MANAGEMENT AND DIETETICS

PSO NO	The Students of M.Sc., Food Service Management & Dietetics will be able to	POs Addressed
PSO1	Analyze scientific concepts in the area of Nutrition, Food Service Management and Dietetics.	PO1
PSO2	Apply critical thinking, technical skills and collaborative approach in food and nutrition, dietetics and managerial practices.	PO2, PO3
PSO3	Develop core competency skills through experimental work, internship and projects to support actions that promote social development.	PO3, PO5
PSO4	Utilize local, national and global trends, emerging techniques and changes of legislation to enhance work performance.	PO4
PSO5	Establish entrepreneurial skills in designing innovative healthy food products and facility planning.	PO2, PO5

SEMESTER I	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23PFS1CC1	FOOD SERVICE MANAGEMENT	CORE	6	5

Course Objectives

- Understand principles of organization and management in food service units
- Understand and apply current concepts in equipment design, selection and use, hygiene, safety and sustainability of food services
- Develop skills required for managing a food service unit

Pre requisites

- Basic knowledge on principles of management
- Fundamentals of tools of management

Course Outcome

CO Number	CO Statement	Cognitive Level
CO 1	Recall the classification of food services, distinguish between different food service systems, relate the food production systems to the relevant food service operations, explain current trends in food service facility design and regulations for specific food service types.	K1, K2
CO 2	Define the different types of organization; Explain the approaches, principles, functions and tools of management, apply the tools of management to the various management functions.	K1,K2, K3
CO 3	Classify equipment based on type and order of use, explain the different finishes, design and construction features of equipment, develop SOP for selection, operation and care of major equipment.	K2, K3,
CO 4	Ascertain the principles of cleaning and sanitation, create a checklist to ensure personal hygiene of food handlers, evaluate the causes of food hazards and suggest solutions based on principles of HACCP	K4, K5
CO 5	Identify the causes for accidents and suggest methods for prevention; Analyze methods of conserving energy, conserving resources and ensure zero waste. Evaluate strategies for conserving natural resources, energy saving and facility waste assessment and management.	K1, K3, K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	2	3	1
CO2	3	3	3	2	3	3	3	2	3	1
CO3	3	3	3	2	3	3	3	2	3	1
CO4	3	3	3	1	3	3	3	2	3	1
CO5	3	3	3	2	3	3	3	2	3	1

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Food Service Industry- Classification and regulatory requirements <ol style="list-style-type: none"> Classification of food services based on food production systems: (i) Conventional (ii) Commissary (iii) Ready prepared (Cook chill/ cook freeze) (iv) Assembly/ serve foods service systems (v) Cloud kitchens. Classification based on market segment/ Food service style Commercial and non commercial food services. Catering in hotels and specialty restaurants, clubs, café/coffee shop, dhaba, fast food outlets (Quick Serve Restaurants) food trucks, food carts and stands, meals on wheels, food vending machines, take away, online app – based delivery. Catering transport services – Air, railway, cruise ships, space missions. Catering in hospital and educational institutions. Industrial catering and community feeding (Places of worship), Social catering (weddings, functions). Franchise, chain, contract and outdoor catering services. Current trends in facility design, regulatory requirements and special considerations for each specific type of food services. 	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Organization and Management <ol style="list-style-type: none"> Organization – Definition and types. Approaches to management – classical, neo classical, systems approach, behavioral and human relations approach, contingency approach, JIT (Just in time) approach. Principles, functions and tools of management and their application in the food service industry. 	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Equipment design, selection, installation and use <ol style="list-style-type: none"> Classification of equipment – equipment for food storage, pre-preparation, cooking, holding, serving, dishwashing and auxiliary equipment. Equipment design, construction and finishes. Factors influencing selection of equipment; Trends in equipment available in the market. Installation, principles of operation and care of major equipment. 	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Hygiene and Sanitation in the Food Service Unit <ol style="list-style-type: none"> Personal hygiene of employees Employee health and personal hygiene, proper food handling – precautions for safe food production. 	25	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	<p>b) Hygiene of plant and equipment Principles of cleaning and sanitation. Dishwashing – types and uses.</p> <p>c) Food hygiene</p> <ul style="list-style-type: none"> • Infestation of foods – signs of infestation, control of infestation. • Time – Temperature relationships, potential hazards in food production. • The seven principles of Hazard Analysis Critical Control Points (HACCP) and their application in ensuring food safety and quality. • Introduction to ISO specifications; COVID Protocol according to FSSAI for food production. 			
V	<p>Safety and Sustainability</p> <p>a) Safety in Food Service Units – causes and prevention of accidents, 3Es of safety and action for emergencies.</p> <p>b) Sustainable practices and green initiatives</p> <p>i. Conservation of natural resources – water and energy conservation.</p> <p>ii. Green design and energy saving in electrical equipment.</p> <p>iii. Integrated solid waste management – sources, reduction, reuse/up cycle and recycle; facility waste assessment; pest control.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Difference between commercial and non commercial food services,</p> <p>Relate functions of management with food industries,</p> <p>Difference between electrical and nonelectrical equipment used in food service institution,</p> <p>Hygienic practices to be followed by food handlers,</p> <p>Methods of pest control.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Arora R K. (2007). *Food Service and Catering Management*. A.P.H Publishing Corporation. New Delhi.
2. Malhotra R.K.(2005). *Food Service and Catering Management*. Anmol publications Pvt Ltd. New Delhi.

Reference Books

1. West B.B, Wood L, Harger V.P. (2006). *Food Service in Institutions*. John Wiley and Sons, Inc., New York
2. Sethi, M. (2016). *Institutional Food Management*, (2nded). New Age International Pvt. Ltd., New Delhi.
3. Payne-Palacio J and Theis M. (2019). *Food Service Management-Principles and Practices*. Pearson India Education Services Pvt. Ltd. Noida, India.
4. Negi J. (2006). *Food and Beverage: Management and Cost control*. Kanishka publishers distributors

Web links

- <https://legaldocs.co.in/blog/food-safety-and-hygiene-norms-in-india>
- https://www.brainkart.com/article/Definition-and-Types-of-Equipment_35155/
- <https://www.mooc-list.com/course/innovation-food-industry-futurelearn>
- https://www.tutorialspoint.com/food_and_beverage_services/food_and_beverage_services_hygiene_and_safety.htm

Journals

1. The Journal of Food Service Management and Education, published by Food Service systems management education council
2. Journal of Food Service Business Research, Taylor & Francis

Pedagogy

Chalk and talk, Power Point Presentation, Discussion, Assignment, Quiz, Seminar

Course Designer

- MS. C. NIVETHA

SEMESTER I	INTERNAL MARKS:25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
23PFS1CC2	FOOD SCIENCE	CORE	6	5

Course Objectives

- Learn the basic scientific principles underlying food preparation, processing, storage and preservation
- Comprehend the Nutritional significance of various food groups
- Get acquainted with the recent trends and novel concepts in food science

Pre requisites

- Basic knowledge about food groups and nutritional composition
- Fundamentals of food chemistry

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Understand the basic nutrition facts of different food groups and state the best cooking practices to retain the nutrients	K1, K2
CO2	Illustrate the chemistry of foods	K2
CO3	Apply the scientific principles underlying food preparation, processing, storage and assess innovative practices to retain the quality of food	K3, K5
CO4	Identify and apply the appropriate subjective and objective methods while evaluating food quality	K3,
CO5	Analyze the role of nutraceuticals, functional foods and alternative protein sources and evaluate their potential as indispensable future foods	K4, K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	1	3	1
CO2	3	3	3	2	3	3	3	1	3	1
CO3	3	3	3	2	3	3	3	1	3	1
CO4	3	3	3	2	3	3	3	1	3	1
CO5	3	3	3	2	3	3	3	1	3	1

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Evaluation of food quality, Food adulteration and Food additives</p> <p>a) Physical Characteristics of Foods-Colour, appearance, density, volume, viscosity, tenderness and loss of weight. Microscopic Examination, Chemical and physico - chemical methods. Sensory characteristics of food.</p> <p>b) Subjective techniques- Sensitivity tests, Difference tests, Rating tests and Descriptive tests. Selection of taste panel members. Objective Techniques- Measurement of colour, texture, viscosity and consistency. Factors affecting the acceptability of foods.</p> <p>c) Food adulteration- types, adulterants, and ways to detect them.</p> <p>d) Food additives- role in cooking- FSSAI- regulations.</p>	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	<p>Cereals and Pulses</p> <p>a) Cereals- Rice, Wheat, Millets-structure, composition, nutritive value, and processing- cereal products. Storage of grains. Nutritional significance of pseudocereals- quinoa, amaranth seeds, and buckwheat.</p> <p>b) Cereal cookery-Starch- Gelatinisation, factors affecting gelatinisation - changes in cooked starches-gel formation, retrogradation and syneresis. Cereal protein-gluten, factors affecting gluten formation, nutrient changes during different processing methods of cereals. Dextrinization.</p> <p>c) Pulses-composition, nutritive value, and processing methods-pulse products, TVP, toxins in pulses- Pulse cookery-soaking, germination, fermentation, roasting and puffing process of pulses. Effect of cooking on nutritive value, quality, and quantity of legumes.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

III	Animal Foods a) Milk and milk products-composition, nutritive value, physical and chemical characteristics-effect of heat, acid, enzymes and tannins. Milk cookery- problems in milk cookery. Processing of milk. Milk products. Milk storage. b) Meat- structure, composition, nutritive value, post-mortem changes in meat, rigormortis, ageing, tenderisation of meat. Meat cookery- selection of meat and methods of cooking, changes in meat during cooking. Poultry- classification, composition, nutritive value, selection of poultry and methods of cooking. Storage and preservation of meat. Fish- classification, composition, nutritive value, selection of fish, methods of cooking, storage and preservation of fish. c) Egg-structure, composition and nutritive value. Grading and selection. Egg cookery-coagulation of egg protein- factors influencing coagulation-role of egg in cookery. Egg white foam- factors influencing foam formation. Storage and preservation of egg.	25	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Vegetables, Fruits, and Beverages a) Vegetables- classification, composition, nutritive value, selection, storage and preservation. Pigments-classification- effect of cooking on pigments, flavour compounds, texture. b) Fruits- classification, composition, nutritive value, selection, storage, and preservation. Enzymatic browning and its prevention. Physico-chemical changes in vegetables and fruits- ripening, respiration and textural changes. Changes in nutritive value due to cooking and processing. c) Beverages- classification, types of beverages-fermented, non- fermented beverages, fruit beverages, malted beverages. Coffee, tea and cocoa processing.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Nuts, oilseeds, Fats, sugar and spices, Recent concepts in food science a) Nuts and oilseeds- composition and nutritive value, toxicants present. Fats and oils-sources and processing- fat cookery- fat as emulsifying, leavening, shortening agent, factors affecting fat absorption-rancidity, its types. b) Sugar- crystallisation and factors affecting crystallisation, caramelisation- Stages of sugar cookery and its role in Indian sweet preparations. Spices, herbs, and condiments used in cookery- its medicinal value. c) Recent concepts in Food Science- Nutraceuticals, Functional foods, sustainable alternative proteins (plant proteins, algae, and microalgae, mycoprotein), biofortification, organic food.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Role of food additives in food industry, Benefits of Sprouting, Coagulation of egg protein, Reactions of enzymatic browning, Processing methods of nuts and oilseeds.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
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Text Books

1. Shakuntala Manay, N. (2013). *Foods: Facts and Principles*. (3rded.). New Age International Publishers, New Delhi.
2. Swaminathan. M. (2019). *Advanced Text Book on Food and Nutrition*. (2nded.). Bangalore Printing and Publishing Co. Ltd, Bangalore.
3. Srilakshmi.B. (2020). *Food Science*. (8thed). New Age International Publishers, New Delhi.
4. Avantika Sharma. (2019). *Textbook of Food Science and Technology*. (3rded.). CBS Publishers and Distributors, New Delhi.
5. Iqbal, Syed Aftab. (2011). *Advanced Food Chemistry*. Discovery Publishing House, New Delhi.
6. Chopra H,K and Panesar P,S.,(2015). *Food Chemistry*. Narosa Publishing House (P) Ltd, New Delhi.

Reference Books

1. Norman N.Potter, (2007). *Food Science*, (5th ed). CBS Publishers and Distributors Pvt.Ltd.
2. Sadasivam.S.A,Manickam, (2008). *Biochemical methods for agricultural sciences*. New Age International Publishers, New Delhi.
3. Vickie, A., Vaclavik Elizabeth, W., Christian, (2014). *Essentials of Food Science*, (4th ed.), Springer Science and Business Media, New York.
4. Raheena Begum, M., (2015). *Textbook of Foods, Nutrition and Dietetics*, (3rd ed.), Sterling Publishers Pvt. Ltd, New Delhi.
5. Rick Parker, Miriah Pace (2020), *Introduction to Food Science and Food Systems* (2nd ed.), CBS Publishers

Web Links:

- <https://epgp.inflibnet.ac.in/>
- <https://www.ifst.org/lovefoodlovescience/resources>
- <https://libguides.reading.ac.uk/food/e-resources>
- <https://libguides.ntu.edu.sg/food-science-technology/eresources>
- <https://foodresearchgh.org/e-resources>

Journals

1. Food Chemistry, Elsevier Sci. Ltd, England
2. Food Science and Technology, Soc Brasileira Ciencia Tecnologia Alimentos, Brazil
3. Food Research International, Elsevier Science Bv, United States
4. Journal of Food and Agriculture, Wiley-Blackwell, England
5. Journal of Food Science and Technology, Scientific Publishers, India

Pedagogy

Chalk and talk, E-content, Lecture, Power point presentation, Seminar, Assignment.

Course Designers

- Ms.T.R.REVATHI

SEMESTER I	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23PFS1CC3	HUMAN PHYSIOLOGY	CORE	6	5

Course Objective

- Gain basic understanding of human anatomy and physiology.
- Understand the integrated functioning of cells, tissues, organs and systems to maintain life.
- Describe the structure of major human organs and explain their role in maintenance of health

Pre requisites

- Prior knowledge on human physiology
- Fundamentals of structure and function of human organs.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Label composition and functions of blood and physiology of cell	K1
CO2	Interpret physiological of circulatory and respiratory system	K2
CO3	Predict various homeostasis of human body.	K3
CO4	Ascertain regulation of digestive and excretory system	K4
CO5	Evaluate structure and function of endocrine and reproductive system	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	-	3	1	-	3	-	3	3	2
CO2	3	-	3	1	-	3	-	3	3	2
CO3	3	-	3	1	-	3	-	3	3	2
CO4	3	-	3	1	-	3	-	3	3	2
CO5	3	-	3	1	-	3	-	3	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Physiology of Cell, Cell Membrane, Nerve and Muscle. a. Internal Environment - The Concept of Homeostasis. b. Cellular level of organization – Review of structure and function of cell and its organelles. Cell division, control of cell growth and reproduction; cell differentiation; c. Membrane physiology – Transport of substance – diffusion, facilitated diffusion, Active Transport. Membrane Potential and Action Potential- Resting Membrane Potential. d. Excitation of Skeletal Muscle Neuromuscular Junction; Neuromuscular Transmission, Excitation and Contraction Coupling.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Digestive system a. Review of structure and function - Secretory, Digestive and Absorptive functions - Role of liver, pancreas and gallbladder. b. Motility and hormones of GIT. c. Regulation of food intake –role of hunger and satiety centres, effect of nutrients.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Circulatory, Cardio-Vascular and Respiratory system a. Blood composition, functions, clotting and haemostasis. Normal levels and functions of plasma proteins, RBC's, WBC's and platelets; Erythropoiesis; Blood groups and histocompatibility. b. Structure and function of heart and blood vessels –Regulation of cardiac output and blood pressure; heart failure; hypertension. c. Respiratory system: Review of structure and function. Role of lungs in the exchange of gases. Transport of oxygen and CO ₂ . Exchange of gases at the lungs and tissues. Regulation of Respiration.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

IV	Excretory and Nervous system a. Structure and function of nephron - Urine formation; Excretion of a concentrated and dilute urine; Role of kidney in maintaining pH of blood. b. Water, electrolyte and acid base balance – diuretics c. Organization of Central and Peripheral nervous system - Structure and functions of the brain, spinal cord; ANS.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Immune, Endocrine and Reproductive system a. Cell-mediated and humoral Immunity Activation of WBC and production of antibodies. Role in inflammation and defence. b. Endocrine glands (Pituitary gland, Thyroid, parathyroid, Islets of Langerhans, Adrenals, Ovary and Testis, Thymus, Pineal gland – structure, function, role of hormones, regulation of hormonal secretion.) c. Reproductive System – Review of male and female reproductive system; spermatogenesis, ovulation, menstruation, pregnancy and lactation; menopause	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Types of active transport, Role of Ghrelin, Cardiac Index, Functions of Neuro transmitters, Importance of Interferon.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

TextBooks

1. Sembulingam.(2016).*EssentialsofMedicalPhysiology*.HealthSciencesPublisher.New Delhi.
2. Subramanyam.,Sarada.(2018).*TextbookofHumanPhysiology*.S.ChandandcompanyLtd, NewDelhi.
3. Randhawa.S.S.,AtulKabra.(2017).*HumanAnatomyandPhysiology*- I.S.VikasandCompany,India.
4. Muruges.N.(2010).*AnatomyPhysiologyandHealthEducation*.(6thed.).

ReferenceBooks

1. Guyton (2000). Guyton and Hal *Textbook of Medical Physiology*. Saunders. United States of America.
2. Waugh Anne Ross and Wilson (2003). *Anatomy and Physiology in Health and Illness*. Churchill Livingstone. New York.
3. Muruges N (2011). *Anatomy and Physiology*. Sathya Publishers. Madurai.
4. Wilson, Ross (2014). *Anatomy and Physiology in Health and Illness*. Reed Elsevier India Private Limited. New Delhi.

Weblinks

- <https://www.khanacademy.org/science/health-and-medicine/human-anatomy-and-physiology>
- <https://www.biologyonline.com/tutorials/the-human-physiology>
- <https://digitaleditions.library.dal.ca/intropsychneuro/chapter/hunger-and-eating/>
- <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=NuAs6SreCGryddEfs4kkBA=>

Journals

- 1.Human Physiology, Maik Nauka/Interperiodica Publishing, Russian Federation.
- 2.Indian Journal of Clinical Anatomy and Physiology, publication Pvt. LTD, India.
- 3.American Journal of Physiology- Endocrinology and Metabolism, American Physiological Society, United States.
- 4.Canadian Journal of Physiology and Pharmacology, Canadian Science Publishing, NrcResearch Press, Canada.

Pedagogy

E-content, Lecture, Powerpoint presentation, Seminar, Assignment, Practical.

CourseDesigners

- MS. ARTHY . R

SEMESTER I	INTERNAL MARKS:40		EXTERNAL MARKS:60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
23PFS1CC1P	FOOD SCIENCE (P)	CORE PRACTICAL	6	5

Course Objective

- Learn the basic scientific principles underlying food preparation, processing, storage and preservation
- Comprehend the nutritional significance of various food groups
- Get acquainted with the recent trends and novel concepts in food science

Pre requisites

- Basic skills on preparation of various recipes
- Fundamentals of food chemistry

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Identify the common food adulterants and additives	K1
CO2	Explain the factors affecting cooking quality of foods	K2
CO3	Prepare various food items by applying innovative practices	K3
CO4	Determine the suitable cooking practices to retain the nutrients	K4
CO5	Evaluate the scientific principles involved in food preparation, processing and storage	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	1	3	1
CO2	3	3	3	2	3	3	3	1	3	1
CO3	3	3	3	2	3	3	3	1	3	1
CO4	3	3	3	2	3	3	3	1	3	1
CO5	3	3	3	2	3	3	3	1	3	1

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

List of Experiments

1. Evaluation of food quality, Food adulteration and Food additives

- a) Identify and detect Common food adulterants in foods.
- b) Carryout a Market survey on food additives present in processed foods.

2. Cereals and Pulses

- a) Study the factors affecting gelatinization and prepare recipes where gelatinisation is hastened and retarded.
- b) Interpret the factors influencing the quality of chapathis.
- c) Prepare any two recipes to show the impact of dextrinization.
- d) Find the factors affecting cooking quality of pulses, prepare recipes which enhance nutritional quality of pulses.

3. Animal Foods

- a) Determine the factors affecting coagulation of milk proteins.
- b) List the problems in milk cookery and find ways to prevent them.
- c) Find the optimum temperature and time for boiling egg.
- d) Study the factors influencing egg white foam formation.

4. Vegetables, Fruits, and Beverages

- a) Determine the various factors influencing the changes in vegetables with respect to colour, texture and flavour compounds during cooking.
- b) Observe enzymatic browning reactions in vegetables and fruits and ways to overcome them.
- c) Determine the best method of preparing coffee and tea.
- d) Prepare one nourishing, soothing, refreshing and appetizing beverage.

5. Nuts, oilseeds, Fats, sugar and spices, Recent concepts in food science

- a) Find the smoking point of oils.
- b) Determine the factors affecting oil absorption
- c) Observe the different stages in sugar cookery and prepare crystalline and non- crystalline candies.

Text Books

1. Shakuntala Manay, N. (2013). *Foods: Facts and Principles*. (3rd ed.). New Age International Publishers, New Delhi.
2. Swaminathan. M. (2019). *Advanced Text Book on Food and Nutrition*. (2nd ed.). Bangalore Printing and Publishing Co. Ltd, Bangalore.
3. Srilakshmi.B. (2020). *Food Science*. (8th ed.). New Age International Publishers, New Delhi.
4. Avantika Sharma. (2019). *Textbook of Food Science and Technology*. (3rd ed.). CBS Publishers and Distributors, New Delhi.
5. Iqbal, Syed Aftab. (2011). *Advanced Food Chemistry*. Discovery Publishing House, New Delhi.
6. Chopra H,K and Panesar P,S.,(2015). *Food Chemistry*. Narosa Publishing House (P) Ltd, New Delhi.

Reference Books

6. Norman N.Potter, (2007). *Food Science*, (5th ed). CBS Publishers and Distributors Pvt.Ltd.
7. Sadasivam.S.A,Manickam, (2008). *Biochemical methods for agricultural sciences*. New Age International Publishers, New Delhi.
8. Vickie, A., Vaclavik Elizabeth, W., Christian, (2014). *Essentials of Food Science*, (4th ed.), Springer Science and Business Media, New York.
9. Raheena Begum, M., (2015). *Textbook of Foods, Nutrition and Dietetics*, (3rd ed.), Sterling Publishers Pvt. Ltd, New Delhi.
10. Rick Parker, Miriah Pace (2020), *Introduction to Food Science and Food Systems* (2nd ed.), CBS Publishers

Web Links:

- <https://epgp.inflibnet.ac.in/>
- <https://www.ifst.org/lovefoodlovescience/resources>
- <https://libguides.reading.ac.uk/food/e-resources>
- <https://libguides.ntu.edu.sg/food-science-technology/eresources>
- <https://foodresearchgh.org/e-resources>

Pedagogy

Chalk and talk, E-content, Lecture, Power point presentation, Seminar, Assignment, Demonstration

Course Designer

- Ms.N.GANGA DEVI

SEMESTER I	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
23PFS1DSE1A	FOOD MICROBIOLOGY, SAFETY AND QUALITY CONTROL	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To identify the beneficial effects of the microorganisms
- To evaluate the principles of sanitation
- To apply the laws and regulations related to food safety and quality control

Pre requisites

- Basic Knowledge on Food Science, Food chemistry
- Fundamentals of Food Microbiology

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Recall the important genera of microorganisms associated with food. Understand the Scope of food microbiology and food safety.	K1
CO2	Explain the suitable techniques for enumeration of microbes and methods (traditional to advanced) for preserving food	K2
CO3	Compute the role of different micro organisms in food spoilage, food fermentation and food-borne diseases and suggest ways to prevent food spoilage and food borne diseases	K3
CO4	Determine and recommend methods for microbiological quality control. Create investigation procedures for ensuring food safety and Hygiene	K4
CO5	Assess the food safety rules and regulations, Comprehend the use of Food Safety Management System (FSMS), and conduct Microbiological Risk Assessment.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	1	3	2	2	3	2	2	3	1
CO2	2	1	3	2	3	3	2	2	3	1
CO3	2	1	3	2	2	3	2	2	3	1
CO4	2	1	3	2	2	3	2	2	3	2
CO5	2	1	3	2	2	3	2	2	3	1

“1”–Slight (Low) Correlation “2” Moderate (Medium) Correlation

“3”–Substantial (High) Correlation “-” indicates there is no correlation

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	<p>Determination of microorganisms and their relevance in food</p> <p>a) Importance and significance of microorganisms in food. Factors affecting the growth of microorganisms in food – Intrinsic and Extrinsic parameter.</p> <p>b) Sampling, sample collection, transport and storage, sample preparation for analysis. Microscopic and culture dependent methods- ,culture, enumeration and isolation methods.</p> <p>c) Chemical and Physical methods-Chemical ,immunological and nucleic acid based methods; Culture independent techniques – PCR Based, DGGE, Meta genomics, etc.; Analytical methods for microbial metabolites-microbial toxins and metabolites.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	<p>Spoilage and Preservation of Foods from microbial contamination</p> <p>a) Characteristic features, dynamics and significance of spoilage of different groups of foods - Cereal and cereal products, vegetables and fruits, meat poultry and sea foods, milk and milk products, packed and canned foods.</p> <p>b) Chemical, Modified atmosphere, Radiation of foods from the microbiological angle.</p> <p>c) Indicators of water and food safety and quality: Microbiological criteria of foods and their Significance. ISO systems for food safety.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	<p>Food borne diseases and food safety concept</p> <p>a) Bacterial food borne diseases (Staphylococcal intoxicification, Botulism, Salmonellosis, Shigellosis, Bacillus cereus Gastroenteritis) Food (Norovirus, Reovirus, Rotavirus, Astrovirus, Adenovirus, Parvovirus, Hepatitis A Virus) Food Borne Animal Parasites Protozoa–Giardiasis, Amebiasis, Taeniasis. Roundworm– Trichinosis, Mycotoxins: Aflatoxicosis, Ergotism. Drug resistance-phenomena and mechanism.</p> <p>b) Food safety concept- Importance of food safety in the food processing industry Risk classification, National and international food regulatory agencies,</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	General food laws and food safety regulations, Nutritional labeling regulation (mandatory and optional nutrients, nutritional descriptors and approved health claims); Microbial contamination (including cross-contamination/indirect contamination) Chemical contamination, Physical contamination, Allergen contamination.			
IV	Food Safety Programs a) Definitions and importance of Good Manufacturing Practices (GMPs), Facility Maintenance, Personal Hygiene and Supplier Control. b) Sanitary Design of Equipment and Infrastructure, Procedures for Raw Material Reception, Storage and Finished Product Loading. c) Sanitation Program Sanitation Standard Operating Procedures (SSOPs), Product Identification, Tracking and Recalling Program, Preventive Equipment Maintenance Program, Education and Training Program.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Food Safety Regulation for Quality Control a) An overview of Food Regulation in India; Food Laws and Regulations; Structure, organization and duties of regulatory system. b) Duties and responsibilities of food business operator; Registration and Licensing process and requirements; Traceability; Import and Export of Foods; Liability for Defective Products; Food safety management systems and certifications. c) Regulation of special category Foods: Regulation of Irradiated foods; Regulation of Biotechnology and Genetic Modifications; Regulation of Dietary Supplements, Functional Foods and Nutraceuticals.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELFSTUDYFORENRIICHMENT (Not to be Included for External Examination) Morphological characteristics of Microorganisms, Application of HACCP principles for food safety, Bacterial food borne diseases –Clostridium Perfringens gastroenteritis, Components of Pest Control Program, Uses of food Labeling.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Frazier William, C. (2014). *Food Microbiology*. (5th ed) McGraw Hill Irwin Companies. New York
2. Adams. (2018) *Food Microbiology*. (2nd ed).New Age International Publishers. New Delhi.
3. Pelczar Jr Michael, J. (2014) *Microbiology*. McGraw Hill Education (India) Private Ltd, New Delhi.

Reference Books

1. Sugandhar Babu R P. (2008) *Food Microbiology*. Adhyayan Publishers and distributors, New Delhi.
2. Vijaya Ramesh k. (2007) *Food Microbiology*. (1st ed).New Age International Publishers. New Delhi.
3. Bohra and Parihar. (2012) *Food Microbiology*. Student edition, Jodhpur
4. Anathanarayan, (2013) *Textbook of Microbiology*. University Press (India) Pvt. Ltd, Hyderabad.

Web Links

- <https://egyankosh.ac.in/bitstream/123456789/61874/1/UNIT%201%20Introduction%20to%20Food%20Microbiology%20Microbiology.pdf>
- <https://egyankosh.ac.in/bitstream/123456789/35007/1/Unit2.pdf><https://egyankosh.ac.in/bitstream/123456789/12424/1/Unit-3.pdf>
- <https://egyankosh.ac.in/bitstream/123456789/33296/1/Unit-4.pdf>

Journals :

1. Journal of Microbiology and Infectious Disease, Turkey.
2. Journal of Basic Microbiology, Wiley-Blackwell, Germany.
3. Journal of Microbiology, Microbiological Society Korea, South Korea.
4. Journal Applied Microbiology, Cardiff, U K.

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment

Course Designer

- Ms. M.VINOTHINI

SEMESTER I	INTERNAL MARKS : 25		EXTERNAL MARKS : 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDIT
23PFS1DSE1B	NUTRITION THROUGH LIFE CYCLE	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- Understand the importance of nutrition through various life stages.
- Determine nutrient needs for all age groups and calculate the basic nutritional requirements.
- Develop a plan of action and implement nutritional care plan for every age group.

Pre requisites

- Principles of nutrition and application of meal planning guidelines throughout life cycle.
- Fundamentals of community nutrition.

Course Outcomes

CO Number	CO statement On the successful completion of the course, students will be able to	Cognitive level
CO 1	Identify national nutritional guidelines for various life stages	K1
CO 2	Interpret nutritional care plan for all age groups	K2
CO 3	Predict physiological changes in various stages of life cycle	K3
CO 4	Ascertain nutritional strategies to combat the infections, deficiencies and disorders	K4
CO5	Conclude menu and develop diet charts according to nutritional requirements of different age groups	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	-	3	3	-	3	3
CO2	3	3	3	3	-	3	3	-	3	3
CO3	3	3	3	3	-	3	3	-	3	3
CO4	3	3	3	3	-	3	3	-	3	3
CO5	3	3	3	3	-	3	3	-	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Pre natal and Infant nutrition a. Foetal origins of adult disease, intrauterine growth retardation, low birthweight, cleft palate, foetal alcohol syndrome—causes and consequences. b. Infancy – current feeding practices and nutritional concerns, guide lines for feeding normal and low birth weight infants. Growth and nutritional assessment – Growth chart, LBW babies – characteristics and nutritional care. c. Nutritional assessment, nutrient needs, lactose intolerance,	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Nutrition during childhood a. Childhood – Growth and development, food and nutrient needs, dietary adequacy. Factors influencing food choices, food acceptance, parental influences. Development of healthy gut microbiome. Aetiology and treatment of PEM, Vitamin A Deficiency, Anaemia. Planning meals for children with Attention-deficit/hyperactivity disorder (ADHD), autism and dyslexia. Immunization schedule for children. b. School age - Growth and development, food and nutrient needs, dietary adequacy. Food choices, meal patterns, prevention of nutrition and health problems. Causes and consequences of stunting, underweight, wasting, overweight, obesity and dental caries. c. Packed lunch-Dietary guidelines and nutritional requirements. Planning packed lunch for various income groups.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Nutrition during adolescence a. Growth and development, food and nutrient requirements b. Food habits, irregular meal pattern, peer pressure, eating disorders. Pros and cons of popular fad diets. Planning balanced diets for adolescents.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	c. Causes, consequences and treatment of adolescent pregnancy, PCOD, hormonal imbalance, premenstrual syndrome, anaemia, underweight, obesity.			
IV	Nutrition during pregnancy and lactation a. Lactation and breast milk – Physiology of lactation. Nutritive value and composition of breast milk - Colostrum. Food and nutrient requirements for nursing mother, advantages of breast feeding, importance of breastfeeding over formula feeds. Public health measures for pregnant and lactating women. Complications during lactation. b. COVID protocols for pregnant and lactating women. Planning balanced diets for pregnant and lactating women	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Nutrition in Adulthood and Old Age a. Food and nutrient requirements during adulthood. Nutritional concerns in adulthood related to nutrient deficiencies. Signs and symptoms of menopause. Effect of occupational hazards, stress related disorders and lifestyle modifications to overcome them. b. Geriatric nutrition - Food and Nutritional requirements - Nutritional care of the elderly. Physiological changes affecting digestion and absorption. Food selection patterns of the elderly. Nutritional problems of old age. c. Planning balanced diets for adults and elderly based on special needs and requirements.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Classification of weaning foods, Menu planning for PEM, Theories of obesity, Examples of lactogogues foods, Palliative care for elderly people.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Brown Judith, E.(2008) *Nutrition*.(3rd ed.)Thomson Wadsworth USA.
2. Park, K. (2008) *Essentials of Community Health Nursing*(5th ed.).M/s Banarsidas Bhanot Publishers.Jabalpur.
3. Josephine Martin and Charlotte Beckett Oakley, (2008).*Managing Child Nutrition Programs*.(2nd ed.) Jones& Bartlett Publishers.
4. Seema Sonkar and Doreas L. Essiamah, (2008) *Food and Nutrition Security challenges towards combating malnutrition*.Chandralok Prakashan. Kanpur.
5. Bamji M.S, Prahlada Rao N, Reddy. (2016)*Textbook of Human Nutrition*.(4th ed.).Oxford and PBH Publishing Co. Pvt. Ltd. New Delhi.

Reference Books

1. Prakash Shetty,(2002).*Nutrition through the life cycle*.(1st ed.). Leatherhead publishing. Leatherhead International Ltd. UK.
2. Gibney, M.J.,Margetts, B.M.,Kearney, J.M.,Arab, L., (2004).*Public Health Nutrition*. (2nd ed.).UK.Blackwell PublishingCo.
3. Carolyn D. Berdanice., (2009), *Advanced Nutrition*, (2nd ed.). CRC Press.
4. M.Swaminathan., (2012), *Advanced Textbook on Food and Nutrition*. (2nd ed). Bangalore Printing and Publishing Co. Ltd., Bangalore,
5. Raheena Begum. M., (2015), *A textbook of Foods, Nutrition and Dietetics*.(3rd ed.).Sterling Publishers Pvt. Ltd., New Delhi.
6. Park K.,(2021), *Park's Textbook of Preventive and Social*.(26th ed.). M/S Banarasidas, Bharat Publishers, Jabalpur, India.

Web Links

- <https://www.who.int/>
- <https://www.encyclopedia.com/food/encyclopedias-almanacs-transcripts-and-maps/assessment-nutritional-status>
- <https://www.fao.org/about/en/>
- <https://www.nin.res.in/downloads/NNMBREPORT2001-web.pdf>
- <https://www.icmr.gov.in/>

Journals

1. Society for Nutrition Education and Behavior, Elsevier Sci. Ltd, England
2. Journal of the Academy of Nutrition and Dietetics, Elsevier Science Inc publishing, United States.
3. Public Health Nutrition, Cambridge University, England
4. Food Research International, Elsevier Science Inc, United States.
5. Journal of Food and Agriculture, Wiley-Blackwell, England

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar, Visit to ICDS

Course Designers

- Ms.E.AGALYA

SEMESTER I	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
23PFS1DSE1C	FRONT OFFICE OPERATIONS	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To gain knowledge on role of front office as functional area.
- To understand the functions of front office.
- To study the operational aspects of front office.

Pre -requisites

- Fundamentals of hotel functional areas.
- Basics of front office operations.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Illustrate operations of hospitality sector	K2
CO2	Classify hotels on the basis of various criteria	K3
CO3	Predict functionalities of all departments in the industry	K3
CO4	Devise strategies for the profitability of the hotel	K4
CO5	Plan check in and check out of guest	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	-	3	3	3	3	-	3	3
CO2	3	3	-	3	3	3	3	-	3	3
CO3	3	3	-	3	3	3	3	-	3	3
CO4	3	3	-	3	3	3	3	-	3	3
CO5	3	3	-	3	3	3	3	-	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVEL EVEL
I	Hotel Industry Hotel - Definition, Classification based on star Category, size and location. Hotel Organization - Organization Pattern in a large, medium and small sized hotel. Functional Department in a hotel –Front office, Housekeeping, Reservations, Night audit, Loss / Prevention, Security, Food and beverage, Engineering and Sales departments.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
II	The Guest and Guest Rooms Categorizing the guest room - Room types, Room configuration, Room Designations, Room Numbering, Room status reconciliation, Key control systems.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
III	Room Rates , Room Rate Designations and Reservation Rack rate, Corporate rate Volume account rates, Government rate, seasonal rates weekday / Weekend rates, membership rates, Industry rates, Walk in rates, Premium rates, half day rates, Advance Purchase rates, Package rates, Per person rates, group rates. Reservations – Determining occupancy and availability, Availability factors overselling and procedure.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
IV	Front Office Overview The Arrival Chronology - Greeting, Transition, Registration and Completion – Group arrivals. Departure - Front desk Checkout, Guest directed Computer checkout, Automated checkout. Front office operations - Communications, staffing Values added Services – safe deposit boxes, Mail, Telephone and document handling. The Electronic Front Office (EFO).	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
V	Guest Accounting and Night Audit Guest Accounting - Accounting basics, Guest history account – Guest Ledger, City ledger, Accounting entries. Night Audit - Night audit overview, Night audit reporting, Ancillary Night audit duties.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Pod hotel, Functioning of lost and found, Point of Sale System, Property Management System, Software and apps used for Reservation.	-	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5

Text Books

1. Ahmed Ismail. (2004). *Front office operations And Management*. Delmar Publications
2. Sudhir Andrews. (2014). *Hotel Front Office a Training Manual*, (3rd edition) McGraw Hill Education (India) Private Limited.
3. Dr. B.K. Chakravarthi. (2011). *Hotel Front Office Training Manual*. A.P.H Publishing Corporation.
4. R.K. Arora. (2009). *Hotel Organization And Front Office Management*. A.P.H Publishing Corporation.

Reference Books

1. Ahmed Ismail. (2004). *Front office operations And Management*. Delmar Publications.
2. Kyesung chon and Raymond. T. Sparrowe. (2001). *Welcome to Hospitality An Introduction* (2nd ed) Delmar publication.
3. G. Raghubalan, Smritee Raghubalan. (2015). *Hotel Housekeeping operations and Management*, Oxford University Press.
4. Tarachand. (2000). *Hotel and Restaurant Management*. Mohit Publications, New Delhi.
5. S.K. Bhatnagar (2005). *Front Office Management*. Frank Bros. & Co. (Publishers) Limited.
6. Ravi Aggarwal (2010). *Hotel Front Office – Systems & Procedures*, sublime publications.
7. M.A. Khan. (2005). *Front Office*. Anmol Publication Private Limited.

Web Links

- <https://www.ihmnotessite.net/hotel-core-areas>
- <https://www.ihmnotessite.net/classification-of-hotels>
- <https://www.ihmnotessite.net/types-of-rooms>
- <https://www.ihmnotessite.net/fo-organisation>
- https://www.bharatskills.gov.in/pdf/E_Books/FrontOffice1Sem_TP.pdf
- <file:///C:/Users/Lenovo/Downloads/BHM-704ET.pdf>

Journals

1. The Journal of Hospitality & Tourism Research, Sage Publication.

Pedagogy

E-content, Lecture, Power Point Presentation, Seminar, Assignment, Group discussion.

Course Designers

- Ms. S. FATHIMA
- Ms. M. VINOTHINI

SEMESTER -II	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23PFS2CC4	PUBLIC HEALTH NUTRITION	CORE	6	5

Course Objectives

- To understand the importance of nutrition and health.
- To comprehend the nutritional status pertaining to various sectors of population.
- To gain knowledge various intervention programs.

Pre requisites

- Basic knowledge on principles of nutrition.
- Fundamentals of community nutrition.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	State basic sciences relevant to nutrition and apply public health principles to current public health related issues	K1
CO2	Interpret the nutritional status of the population making use of the different evidence- based scientific assessment methods and protocols	K2
CO3	Predict the impact of nutrition policies on the health of individual as well as population	K3
CO4	Differentiate the health and nutritional challenges encountered in different regions and understand the various strategies employed to address them	K4
CO5	Assess Nutrition Education programs for a target population using appropriate aids	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	-	3	3	3	3	3
CO2	3	3	3	3	-	3	3	3	3	3
CO3	3	3	3	3	-	3	3	3	3	3
CO4	3	3	3	3	-	3	3	3	3	3
CO5	3	3	3	3	-	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE
I	<p>Epidemiology – Definition, aim, components, measurement in Epidemiology - IMR, NMR, MMR and tools of measurement, approach, Relation of nutrition to national development - socio-economic, industrial and agricultural development.</p> <p>Nutritional problems - PEM, Vitamin A Deficiency Diseases, Anaemia, Iodine Deficiency Disorders and Fluorosis, Synergism between malnutrition and infection.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	<p>Nutrition Intervention programmes in India</p> <p>Integrated Child Development Services (ICDS), Chief minister's breakfast scheme, Supplementary Nutrition, Bal bhog, Sakhibhog, Shishubhog; Mid-Day Meal (MDM) program; Fortification program, Poshan abhiyaan scheme, Special Nutrition Program (SNP), Balwadi Nutrition Program, Muthulakshmi Maternity Benefit Scheme for pregnant women.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	<p>National Programs to Combat Malnutrition</p> <p>Iron: National Nutritional Anemia Control Program,; Vitamin A: Vitamin A Prophylaxis Program (VAPP); Iodine: National Iodine Deficiency Disorders Control Program (NIDDCP), Universal Salt Iodization (USI), Double Fortified Salt (DFS); National Deworming Campaign; Fluorosis Control Program</p> <p>National organization</p> <p>Indian Council of Agricultural Research (ICAR), Indian Council of Medical research (ICMR), National Nutrition Monitoring Bureau (NNMB), National Institute of Nutrition (NIN), Central Food and Technological Research Institute (CFTRI), Defence Food Research Laboratory (DFRL), National Institute of Public Cooperation and Child Development (NIPCCD).</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	<p>International Organizations</p> <p>World Bank, World Health Organization (WHO) - Sustainable development goals, United Nations International Children's Emergency Fund (UNICEF), World Food Programme (WFP), Voluntary organizations –</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	Global Alliance for Improved Nutrition (GAIN), World Alliance for Breastfeeding Action (WABA)			
V	<p>Nutrition Assessment</p> <p>Direct Method -Anthropometric - Measurement of height, weight, head and chest circumferences, mid upper arm circumference, skin fold thickness, interpretation of measurements and comparison with standards (NCHS, ICMR), Biochemical parameters, Clinical examination and Dietary surveys.</p> <p>Indirect method - Vital Statistics – Interpretation of mortality and morbidity using biostatistics</p> <p>Nutrition Education</p> <p>Meaning, nature and importance of Nutrition education to the community and lessons to be taught. Methods of education- use of audio visual aids, Use of computers to impart nutrition education - power point presentation, E-learning, Organization of Nutrition education programmes: Principles of planning, executing and evaluating nutrition education programmes, problems of nutrition education programmes.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Classification according to grades of malnutrition. Mission of ICDS Diarrhea Control Program. Activities of World Health Organization (WHO). Problems of nutrition education programme.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Brown Judith, E.(2008) *Nutrition*.(3rd ed.)Thomson Wadsworth USA.
2. Park, K. (2008) *Essentials of Community Health Nursing*(5th ed.).M/s Banarsidas Bhanot Publishers.Jabalpur.
3. Josephine Martin and Charlotte Beckett Oakley, (2008). *Managing Child Nutrition Programs*.(2nd ed.) Jones& Bartlett Publishers.
4. Seema Sonkar and Doreas L. Essiamah, (2008) *Food and Nutrition Security challenges towards combating malnutrition*.Chandralok Prakashan. Kanpur.
5. Bamji M.S, Prahlada Rao N, Reddy. (2016) *Textbook of Human Nutrition*.(4th ed.).Oxford and PBH Publishing Co. Pvt. Ltd. New Delhi.

Reference Books

1. Prakash Shetty,(2002).*Nutrition through the life cycle*.(1st ed.). Leatherhead publishing. Leather head International Ltd. UK.
2. Gibney, M.J.,Margetts, B.M.,Kearney, J.M.,Arab, L., (2004).*Public Health Nutrition*. (2nd ed.).UK.Blackwell PublishingCo.
3. Carolyn D. Berdanice., (2009), *Advanced Nutrition*, (2nd ed.). CRC Press.
4. M.Swaminathan., (2012), *Advanced Textbook on Food and Nutrition*. (2nd ed). Bangalore Printing and Publishing Co. Ltd., Bangalore,
5. Raheena Begum. M., (2015), *A textbook of Foods, Nutrition and Dietetics*.(3rd ed.).Sterling Publishers Pvt. Ltd., New Delhi.
6. Park K.,(2021), *Park's Textbook of Preventive and Social*.(26th ed.). M/S Banarasidas, Bharat Publishers, Jabalpur, India.

Web References

- <https://www.who.int/>
- <https://www.encyclopedia.com/food/encyclopedias-almanacs-transcripts-and-maps/assessment-nutritional-status>
- <https://www.fao.org/about/en/>
- <https://www.nin.res.in/downloads/NNMBREPORT2001-web.pdf>
- <https://www.icmr.gov.in/>

Journals

1. Society for Nutrition Education and Behavior, Elsevier Sci. Ltd, England
2. Journal of the Academy of Nutrition and Dietetics, Elsevier Science Inc publishing, United States.
3. Public Health Nutrition, Cambridge University, England
4. Food Research International, Elsevier Science Inc, United States.
5. Journal of Food and Agriculture, Wiley-Blackwell, England

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar, Visit to ICDS

Course Designers

- Ms. S. FATHIMA
- Ms. M. VINOTHINI

SEMESTER - II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23PFS2CC5	ADVANCED DIETETICS	CORE	6	5

Course Objective

- To outline the focus of nutrition and dietetics in the prevention of diseases.
- To analyze the underlying causes, pathophysiology and complications of diseases.
- To acquire Knowledge on principles and planning therapeutic diet.

Pre requisites

- Principles of menu planning.
- Basics of therapeutic nutrition.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	List the causes, symptoms and complications of various diseases	K1
CO2	Describe the importance and principles of dietetics as a modified therapy for various diseases	K2
CO3	Apply the nutritional requirements and menu plans for therapeutic conditions.	K3
CO4	Point out the role of dietitian in the hospitals and interpret the importance of computer in nutrition practice	K4
CO5	Evaluate special feeding methods and psychology of the patients	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	3
CO2	3	3	3	3	2	3	3	3	3	3
CO3	3	3	3	3	2	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT I	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	<p>a) Dietitian Definition and types of dietitians, role of dietitian in the hospital and community.</p> <p>b) Counseling Definition, Counsellor and Client, Classification of Counseling and techniques of counseling.</p> <p>c) Routine Hospital Diet and Special Feeding Methods Routine Hospital Diet -Clear fluid diet, full fluid diet, soft diet, Regular diet. Special feeding methods - Enteral nutrition and Parenteral nutrition.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	<p>a) Diet for Febrile Conditions Pathogenesis, etiology, Metabolic changes, types of fever, symptoms, treatment and dietary modification for febrile condition - acute, chronic and recurrent fevers- typhoid, influenza, malaria, poliomyelitis, rheumatic fever, tuberculosis, HIV and Covid-19.</p> <p>b) Diet for Cancer -Development, etiology, metabolic alterations, symptoms, nutritional and dietary management of cancer patients, side effects of cancer treatment, role of antioxidants in cancer treatment.</p> <p>c) Diet for Developmental Disabilities - Down's syndrome, Cerebral Palsy, Autism and Attention Deficit Hyperactivity Disorder.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	<p>a) Diet for Disease of Gastro Intestinal Tract Pathogenesis, etiology, types, symptoms, treatment and dietary modification for gastro intestinal disorders – Gastritis, peptic ulcer, diarrhea, dysentery, constipation, hemorrhoids, and carcinoma of the stomach.</p> <p>b) Diet for Biliary Tract Disorders Pathogenesis, etiology, types, symptoms and clinical findings and dietary modification for Liver disorders - Fatty liver, Hepatitis and Cirrhosis, Gall bladder disorders - Cholecystitis and Cholelithiasis.</p> <p>c) Diet for Pancreatic Disorders Pathogenesis, etiology, types, symptoms and clinical findings and dietary modification for Pancreatitis.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

IV	<p>a) Diet for Obesity</p> <p>Etiology, energy balance, clinical manifestation, complications, dietary and lifestyle modifications and surgical management.</p> <p>b) Diet for Metabolic Disorders- Diabetes Mellitus</p> <p>Types, screening and diagnostic criteria, pathogenesis, etiology, symptoms, complications, Dietary management of Diabetes Mellitus – Food Exchange system, Glycemic Index, Glycemic Load, nutritive and non-nutritive sweeteners. Lifestyle recommendations, drugs and insulin.</p> <p>c) Diet for Cardio Vascular diseases - Meaning, Pathogenesis, etiology, types, symptoms, treatment and dietary modification for cardio vascular disorders –Hypo tension, hypertension, atherosclerosis, acute and chronic cardiac diseases, and congestive heart failure</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	<p>a) Diet for Renal diseases- Pathogenesis, etiology, types, symptoms, treatment and dietary modification for renal disorders– glomerulonephritis, nephrosis, nephrosclerosis, nephrolithiasis and ureterolithiasis. Dietary modification for dialysis.</p> <p>b) Drug Nutrient Interaction</p> <p>Diet effects on drug disposition, Interactions of drugs and nutrients, Effect of drugs on food intake and absorption, Effect of nutrients on drug metabolism.</p> <p>c) Computers in Nutrition Practice</p> <p>General information – data input, data output, data analysis, data communication, clinical care – communication in patient care, Nutritional therapy.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Activities of IDA -Professional ethics and obligations of dietitian.</p> <p>Aetiology of HIV.</p> <p>Types of jaundice.</p> <p>Theories and grades of obesity.</p> <p>Causes of urinary tract infection</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Mahan, Kathleen, L., Krause's, (2004). *Food, Nutrition and Diet Therapy* (11th ed.), Pennsylvania; Saunders.
 2. Antia, F. P., (2005). *Clinical Dietetics and Nutrition*, (5th ed.). Oxford University Press, New Delhi,
 3. Prakash Lohar, S., (2007). *Endocrinology –Hormones and Human Health*, MJP publishers, Chennai.
 4. Srilakshmi, B., (2009). *Dietetics*, (2nd ed.) New Age International Publications, New Delhi.
 5. Shubhangini Joshi, A., (2014), *Nutrition and Dietetics*, (5th ed.). McGraw Hill, Education Private Limited, New Delhi.
 6. Swaminathan, M., (2012). *Essentials of Food and Nutrition*, Ganesh and Company, Madras.
- Maity, S. P., *Pharmacology for Second Professional Students*, (6th ed.) Books & Allied Pvt. Ltd.

Reference Books

1. Robinson, Corrine, H., (1982). *Normal and Therapeutic Nutrition*, (16th ed.). Macmillan McGraw Hill School Division, New York.
2. Udai Veer, (2007). *Elements of Food Science*, Anmol Publications Pvt Ltd, New Delhi.
3. Srilakshmi, B., (2008). *Nutrition Science*, (3rd ed.). New Age International Publications, New Delhi.
4. Indrani, T.K., (2008). *Nursing Manual of Nutrition and Therapeutic Diet*, (2nd ed.). Jaypee Brothers medical publishers (P) Ltd.
5. Mary Marian, (2008). *Clinical Nutrition for surgical patients*. Jones and Barletta Publishers.
6. Sangeetha Karnik, (2010). *Nutrition and Dietetics Therapy*, Biotech Pharma Publications, Hyderabad.

Web Links:

- <https://gpadampur.files.wordpress.com/2015/08/caft-complete-vedpal.pdf>
- <https://sfsurgery.com/wp-content/uploads/2014/06/Pancreatitis.pdf>
- <https://my.clevelandclinic.org/health/treatments/21098-tube-feeding--enteral-nutrition>
- <https://my.clevelandclinic.org/health/diseases/7104-diabetes-mellitus-an-overview>
- <https://www.mayoclinic.org/diseases-conditions/cancer/symptoms-causes/syc-20370588>

Journals

1. Food and Nutrition Bulletin, Sage Publications Inc, Japan.
2. Food and Nutrition Research, Co-Action Publishing, Sweden.
3. Food Digestion, Springer Verlag, Germany.
4. Nutrition and Cancer, Lawrence Erlbaum Associates Inc. United States
5. Nutritional Therapy and Metabolism, Wichtig Publishing, Italy.
6. Nutrition in Clinical Practice, Sage Publications Inc, United States

Pedagogy

Lecture, assignment, PowerPoint presentation, quiz, seminar, visit to hospital dietary units

Course Designers

- Ms. E. AGALYA
- Ms. N. GANGA DEVI

SEMESTER- II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS2CCC1A	BIOCHEMISTRY AND METABOLIC DISORDERS	CORE CHOICE	6	4

Course Objectives

- To gain knowledge on the metabolism of the nutrients .
- To learn the importance of hormones and enzymes in health and diseases.
- To understand importance of organ function tests in the analysis of clinical manifestations.

Pre requisites

- Basic aspects of nutrient metabolism .
- Fundamentals of physiological functions of organs .

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	State the parameters of biochemistry in disease condition	K1
CO2	Interpret inborn diseases associated with carbohydrate, protein and fat disorder	K2
CO3	Relate importance of hormones and enzymes with diseases	K3
CO4	Associate compensatory mechanism in disease condition	K4
CO5	Appraise appropriate technique to evaluate various organ functions	K5

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	-	2	2	3	3	2	2	3
CO2	3	3	-	3	2	3	3	3	3	3
CO3	3	3	-	2	2	3	3	3	2	3
CO4	3	3	-	3	2	3	3	2	3	3
CO5	3	3	-	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation.

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>a. Biochemical Data Acquisition and Interpretation</p> <p>Basis for biochemical estimation of basic principles- uses of biochemical data in clinical medicine. Acquisition and interpretation of biochemical data.</p> <p>b. Detoxification Mechanism</p> <p>Phase one reaction – Oxidation, Reduction, Hydrolysis, Phase two – Glucuronic acid, sulfate methylation</p> <p>c. Disorders of Erythrocyte Metabolism</p> <p>Hemoglobinopathies, thalassemia, thrombosis</p>	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
II	<p>a. Disorders of Carbohydrate Metabolism</p> <p>Glycohemoglobin, hypoglycemia, galactosemia and ketone bodies, Various types of glucose tolerance tests. Glycogen storage diseases. Inborn errors of carbohydrate metabolism.</p> <p>b. Disorders of Protein Metabolism</p> <p>Phenylalaninemia, homocystinuria, tyrosinemia, maple syrup urine diseases, Phenylketonuria, alkaptonuria, albinism and aminoaciduria. Disorders in purine/ pyrimidine metabolism.</p> <p>c. Disorders of Fat Metabolism</p> <p>Dyslipidemia, Atherosclerosis, Coronary Artery Disease, Disorders of lipoproteins and Steatorrhea.</p>	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
III	<p>a. Disorders of Mineral Metabolism</p> <p>Hypercalcemia, hypocalcemia, normocalcemia, hypophosphatemia and hyperphosphatemia. Electrolytes, blood gases, respiration and acid- base balance. Disorders of acid- base balance and their respiratory and renal mechanisms.</p>	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5

	<p>b. Environmental Pollution and Heavy Metal Poisons</p> <p>Environmental Pollution- Corrosives, Irritants, Pesticides and insecticides, Occupational and industrial hazards, Air pollutants.</p> <p>Heavy Metal Poisons – lead poisoning, mercury poisoning, aluminium toxicity, arsenic toxicity.</p>			
IV	<p>a. Disorders of Hormone</p> <p>Protein hormones (anterior pituitary hormones, posterior pituitary hormones), Steroid hormones (Adrenocorticosteroids, Reproductive endocrinology).</p> <p>b. Clinical Enzymology</p> <p>Creatine kinase, Cardiac troponins, Lactate dehydrogenase Alanine aminotransferase, Alkaline phosphatase Prostate specific antigen Glucose-6- phosphate dehydrogenase, Amylase, Lipase, Enolase</p>	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
V	<p>a. Tissue Protein</p> <p>Collagen- Structure and synthesis, abnormal collagen, Elastin, keratin, Muscle proteins.</p> <p>b. Evaluation of Organ Function Tests</p> <p>Renal - clearance test – Urea clearance, inulin clearance and creatinine clearance, Dye test and Dilution test</p> <p>Hepatic - serum bilirubin, Icteric index, Galactose tolerance test, Hippuric acid Test and Bromsulphthalein test</p> <p>Pancreatic – Secretin stimulation test and Faecal Elastase test</p> <p>Gastric - Determination of free acidity, Fractional test, Examination of duodenal contents.</p>	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Rules to be followed in biochemistry laboratory, Diabetes mellitus, Synergetic mechanism of nutrients, Anemia. Types of Jaundice.</p>	-	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5

RELATED EXPERIENCE

1. Estimation of Hemoglobin (Drabkin's method).
2. Estimation of blood glucose (Folin-Wu method).
3. Estimation of Triglycerides (Enzymatic method)
4. Estimation of Serum Calcium (Arsenzo method)
5. Demonstration of automated Biochemical Analyzer.
6. Qualitative analysis of Urine for normal constituents
7. Qualitative analysis of urine for abnormal constituents

Text Books

1. Ambika Shanmugam (2016). *Fundamentals of biochemistry for medical students* (8th ed.). Lippincott Williams and Wilkins.
2. DM Vasudevan, Sreekumari S, Kannan Vaidyanathan (2013). *Textbook of Biochemistry for Medical Students*. (7th ed) S Jaypee Brothers' medical publisher(p)Ltd.
3. Pattabiraman N.T.(2015). *Laboratory Manual Biochemistry* (4th ed.). All India Publishers and Distributors Regd Chennai.
4. Evangeline Jones (2016). *Manual of Practical Medical Biochemistry*(2nded.) Jaypee Brothers Medical Publishers(p) Ltd.
5. Shanmugam S, Sathish kumar T, Panneer Selvam K (2010). *Laboratory handbook Biochemistry*. (1st ed.) PHI learning Private Ltd.Chennai

Reference Books

1. Beckett Geoffrey (2006). *Clinical Biochemistry*. (8th ed.)Blackwell Geoffrey Publishing Australia.
2. Lajja Das (2014). *Medicinal Biochemistry*.(1st ed.). Venus Books New Delhi.
3. Murray, Robert K (2012). *Harper's Illustrated Biochemistry*. (28th ed) McGraw Hill Irwin Companies New York.

Web links

<https://egyankosh.ac.in/bitstream/123456789/33039/1/Unit-12.pdf>

<https://egyankosh.ac.in/bitstream/123456789/73108/2/Unit-11.pdf>

https://www.cdc.gov/nchs/data/nhanes/nhanes_99_00/lab18_met_biochemistry_profile.pdf

Journals

1. CPD Bulletin Clinical Biochemistry, Rila Publications, Ltd, United Kingdom.
2. Annals of Clinical Biochemistry, Sage Publications Inc, England
3. Clinical Biochemistry, Pergamon-Elsevier Science Ltd, Canada.
4. Indian Journal of Clinical Biochemistry, Association of Clinical Biochemists of India.
5. Journal of Clinical Biochemistry and Nutrition Japan.

Pedagogy

E-content, Lecture, PowerPoint presentation, Seminar, Assignment, Demonstration, Visit to biochemistry lab.

Course Designers

- Ms. S. FATHIMA

SEMESTER -II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS2CCC1B	FOOD QUALITY CONTROL AND REGULATIONS	CORE CHOICE	6	4

Course Objective

- To study the importance of food regulations and quality control in food sectors.
- To understand the regulating authorities for food safety worldwide.
- To know about the regulations and quality control of food in various food industries.

Pre requisites

- To enable the students to understand the need for regulations and safety in food Industries.
- To familiarize with various food standards, laws and regulations.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recite basic laws and regulations followed in various food industries relevant to food quality	K1
CO2	Restate the safety operations involved in food systems	K2
CO3	Apply various regulations and quality control involved in food industries	K3
CO4	Ascertain the steps of food regulation involved in the process of operations in food industries	K4
CO5	Appraise adequate safety regulations and control at different food sectors	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3	2	3	2	3	3
CO2	3	2	2	3	3	2	3	2	3	3
CO3	3	2	2	3	3	2	3	2	3	3
CO4	3	2	2	3	3	2	3	2	3	3
CO5	3	2	2	3	3	2	3	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Introduction to quality control</p> <p>a) Definition of quality control, quality assurance and quality management. Quality attributes- physical, chemical, nutritional, microbial. Quality control and quality assurance- objectives, importance and functions. Methods Of Quality Control. Pre-requisite programme - Good Manufacturing Practices.</p> <p>b) Quality Council of INDIA, History, Objectives, Role of Quality Council of India, Voluntary quality standards and certification.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2,K3,K4,K5
II	<p>Food authority in India</p> <p>a) Food Safety and Standards Act,2006- principles to be followed- provisions as to articles of food, imported items, responsibilities of the food business operator, liability of manufacturers, packers, wholesalers, distributors and sellers. enforcement of the act – licensing and registration of food business.</p> <p>b) Food Safety and Standards Regulations,2011- food product standards and food additives, prohibition and restriction on sales, contaminants, toxins and residues. Food safety and standards regulations,2016-food or health supplements, nutraceuticals, food for special dietary uses, foods for special medical purposes, functional foods and novel food. food safety and standards regulations,2017-organic food, food recall procedure, import food safety and standards regulations,2018-packaging, fortification, advertising and claims, recognition and notification of laboratories.</p>	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
III	<p>Structure and functions of Food Authority</p> <p>a) Food safety officer and their powers, analysis of food – regulations regarding labs involved in food analysis, offences and penalties.</p> <p>b) Promoting safe and wholesome Food (Eat Right India, Food Fortification, SNF, Clean Street</p>	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5

	Food Hub, RUCO and various other social and behavioral change initiatives) training and capacity building, role of State Food Authorities.			
IV	Food Safety Regulations -National and International a) Voluntary based products certifications- Bureau of Indian Standard (BIS), AGMARK, Consumer Protection act (1986). b) Government regulations (Food laws, orders) and amendments and national and international standards – ISI, FPO, codex Alimentarius, ISO. Role of FDA in India Management systems in food quality control, HACCP, TQM and concept of food audit.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
V	International Organizations and Affiliations in Quality control a) Codex Alimentarius-History, operations of Codex Alimentarius (Members, Standard setting and Advisory mechanisms).World Trade Order – Functioning and responsibilities, WTO agreements (SPS/TBT). responsibilities, codex standards and maximum residue limits, current issues under consideration – SPS (Sanitary and phytosanitary measures) agreement. b) Food Labelling- Need for labelling, developing labelling standards at the world level, limitations of labelling safety issues, labelling regarding methods of processing, products derived from modern biotechnology and irradiated product, organic product, genetically modified foods, EU rules and US rules on nutritional labelling, health claims – Approach of US and EU.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Principles of quality control, Hygienic practices to be followed by food handlers, Role of Food safety officer, Functions of AGMARK, Overview of Codex Alimentarius.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Adams., M.R Moss. M.O. (2015), *Food Microbiology*, New Age international(P)ltd, Publishers, New Delhi.
2. Subbulakshmi, G, Shobha A Udipi., (2006), 1st ed *Food Processing and Preservation*, New Age international Publishers, New Delhi,,
3. Roday S., (2008), *Food Hygiene and Sanitation*, Tata McGraw Hill publishing company ltd, New Delhi.
4. Frazier, W.C., (2000) *Food Microbiology*, New Age international(P)ltd, Publishers, New Delhi.

Reference Books

1. Kees A. van der Heijden and Sanford Miller., (1999), *International Food Safety Handbook: Science, International Regulation, and Control*. Published by CRC Press. ISBN 0824793544, 9780824793548.
2. Neal D. Fortin., (2016). *Food Regulation Law, Science, Policy, and Practice*. Wiley
3. Hui, Y.H., (2003). *Food Plant Sanitation*, Marcel Dekker, Inc.
4. Potter N, and Hotchkiss J.H (2008) *Food Science*. CBS Publications and Distributors, New Delhi
5. Srilakshmi B., (2016). *Food Science*. New Age International Publishers, New Delhi

Web References

- <http://www.colss.net>
- <https://www.fssai.gov.in/home>
- http://www.fao.org/trade/docs/LDC-foodqual_en.htm
- http://www.fao.org/ag/agn/agns/capacity_elearning_codex_en.asp
- <http://www.eufic.org/index/en/>
- <http://foodsafety.unl.edu/haccp/start/physical.html>
- <http://www.codexalimentarius.net>
- <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=Cdnwi2LUCCLzrJZ76d/o1A==>

Journals

1. Journal of Packaging Technology and Research. Springer Nature, Switzerland.
2. Food Packaging and shelf life, Elsevier Science Inc, United States.
3. Emirates journal of Food & Agriculture, United Arab Emirates university, UAE

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, E- Content Seminar.

Course Designers

- Ms. T.R. REVATHI

SEMESTER II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE	CATEGORY	HRS / WEEK	CREDITS
23PFS2CCC1C	NUTRITION IN CLINICAL CRITICAL CARE	CORE CHOICE	6	4

Course Objectives

- To understand the special nutritional requirements in critically ill.
- To know the nutritional support system for critically ill.
- To ensure the nutritional needs of the critically ill patient

Pre requisites

- Fundamentals on nutrition.
- Basic knowledge on principles of dietary management.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Label the nutritional assessment methods	K1
CO 2	Explain the principles of nutritional care	K2
CO 3	Predict the nutritional status of critically ill patients	K3
CO 4	Associate importance of enteral and parenteral nutrition	K4
CO 5	Determine role of nutrients in critical care	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	2	2
CO2	3	3	3	3	2	3	3	3	2	2
CO3	3	3	3	3	2	3	3	3	2	2
CO4	3	3	3	3	2	3	3	3	2	2
CO5	3	3	3	3	2	3	3	3	2	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlat

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	<p>Screening and Nutritional Assessment of Critically Ill Patients</p> <p>a. Screening: Diagnosis of malnutrition, Nutrition screening, Methods for nutritional screening Malnutrition Universal Screening Tool, Nutritional Risk Screening, Mini Nutritional Assessment.</p> <p>b. Assessment of Nutritional Status: Direct and Indirect methods, Anthropometric Assessment - Body Mass Index, Mid Arm Circumference, Triceps skin fold thickness; Biochemical assessment; Clinical assessment – temperature, Blood Pressure, Pulse Rate; Dietary assessment – 24-hour recall method, food frequency questionnaires.</p>	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1, K2, K3, K4, K5
II	<p>Nutritional Care for Hospitalized Patients</p> <p>a. Principles of nutrition care – Nutrition care process, Progressive diets- Clear fluid diet, full fluid diet, soft diet, mechanical soft diet and regular diet.</p> <p>b. Surgical Conditions- Hormonal response during surgery, levels of stress, starvation, sepsis, Infections, pre operative diet, post operative diet.</p>	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
III	<p>Special Feeding Methods</p> <p>a. Enteral nutrition – Types, routes, mode of feeding, importance and procedure, advantages and disadvantages of home-based feed, precautions while feeding and complications.</p> <p>b. Parenteral nutrition – Types, composition, procedure, importance of total parenteral nutrition, precautions while feeding and complications. Refeeding syndrome and clinical manifestations of refeeding syndrome.</p>	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
IV	<p>Nutritional Support for Burn and Trauma</p> <p>a. Burns – Principles of nutrition management, mode of feeding, Clinical effects of malnutrition and factors affecting nutritional requirements in burn patients.</p> <p>b. Trauma – Classification, Principles of nutrition management, timing and route of feeding, Clinical effects of malnutrition and factors affecting nutritional requirements in trauma patients.</p>	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5

V	Nutritional Support for Renal, Hepatic, Pulmonary and Cancer a. Renal failure –types, metabolic aspects and nutritional requirement, effects of renal treatment on nutrition and nutritional therapy. b. Hepatic failure – Consequences of hepatic failure upon nutritional status and nutritional support. c. Pulmonary diseases – Types, effects of pulmonary treatment on nutrition and nutritional support. d. Cancer – Treatment – surgery, chemotherapy, radiation, combination and its effect on nutritional status.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Classification of Malnutrition. Guidelines for Pre operative diet in surgical condition Comparison of enteral and parenteral nutrition. Classification of burns. Types of hepatic failure.	-	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5

Textbooks

1. Luc Cynober A, Frederick Moore A., (2003), *Nutrition and Critical Care*, Karger Medical and Scientific Publishers.
2. Khanna K, Gupta S, Seth R, Passi SJ, Mahna R, Puri S., (2013), *Textbook of Nutrition and Dietetics*, Phoenix Publishing House Pvt Ltd.
2. Frederick A. Moore, Edward Abraham., (2017), *Textbook of Critical Care*, Elsevier

Reference Books

1. Verma P K., (2008), *Principles and Practice of Critical Care*, B. I Publications.
2. Pierre Singer., (2013), *Nutrition in Intensive Care Medicine: Beyond Physiology*, Karger Medical and Scientific Publishers.
3. Peter Faber, Mario Siervo., (2014), *Nutrition and Critical Care*, Cambridge University Press.
4. Rajkumar Rajendram, Victor R. Preedy, Vinood B. Patel., (2015), *Diet and Nutrition in Critical Care*, Springer New York.
5. Gail A. Cresc., (2016), *Nutrition Support for critically ill patient*, CRC Press.

Journals

1. Journal, Indian Academy of Clinical Medicine, Med IND, India.
2. Journal of the American Academy of PAs, Wolters Kluwer, United States

Web References

1. <https://www.slhd.nsw.gov.au/rpa/neonatal%5Ccontent/pdf/guidelines/tpn.pdf>
2. [https://www.clinicalnutritionjournal.com/article/S0261-5614\(20\)30194-1/fulltext](https://www.clinicalnutritionjournal.com/article/S0261-5614(20)30194-1/fulltext)
3. https://www.researchgate.net/publication/244829589_Basics_in_Clinical_Nutrition_Nutritional_support_in_trauma
4. https://nutritionguide.pcrm.org/nutritionguide/view/Nutrition_Guide_for_Clinicians/1342058/all/Burns
5. <https://www.nutritioncaresystems.com/chronic-obstructive-pulmonary-disease/>
6. <https://www.cancer.gov/about-cancer/treatment/side-effects/appetite-loss/nutrition-pdq>

Pedagogy:

E-content, Lecture, Powerpoint presentation, Seminar, Assignment

Course Designers

- Ms. M. VINOTHINI
- Ms. C. NIVETHA

SEMESTER II	INTERNAL MARKS: 40	EXTERNAL MARKS: 60		
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23PFS2CC2P	ADVANCED DIETETICS (P)	CORE PRACTICAL	6	5

Course Objective

- To understand the modification of normal diet for therapeutic purpose.
- To acquire the skills of preparing diet for various disease conditions.
- To study the importance of dietitian in hospitals.

Pre requisites

- Application of dietary principles.
- Planning and preparation of modified diet.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recall the importance of therapeutic nutrition	K1
CO2	Illustrate foods to be included and avoided in the treatment of diseases	K2
CO3	Predict the dietary principles in the management of diseases	K3
CO4	Analyse the various disease conditions and prepare menu according to it	K4
CO5	Appraise the developed tools for diet counseling of all conditions.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	3
CO2	3	3	3	3	2	3	3	3	3	3
CO3	3	3	3	3	2	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

List of Experiments

1. Preparation of clear liquid, full liquid and soft diet.
2. Planning and preparing diets for
 - Febrile Conditions –Acute, Intermittent and Chronic
 - Cancer of oral cancer, gastrointestinal tract and cancer cachexia
 - Gastrointestinal disorders – Peptic ulcer, Diarrhea and Constipation.
 - Liver disorders - Hepatitis and Cirrhosis
 - Metabolic disorders – Diabetes mellitus and Obesity
 - Cardio vascular disorders – Sodium restricted diet (Low, moderate, restricted) Hypertension and Atherosclerosis.
 - Renal disorders – Acute Renal Failure, Chronic Renal failure and Renal stones.
3. Diet counseling for
 - Febrile Conditions
 - Gastrointestinal disorders
 - Liver disorders
 - Metabolic disorders
 - Cardio vascular disorders
 - Renal disorders

Text Books

1. Mahan Kathleen L. (2004). Krause's Food, Nutrition and Diet, Therapy, Pennsylvania Saunders
2. Srilakshmi,B. (2009). Dietetics. New Age International Publications, New Delhi.

Reference Books

1. Indrani.T.K. (2008). Nursing Manual of Nutrition and Therapeutic Diet. Jaypee Brothers Medical Publishers Pvt.Ltd.
2. Sangeetha Karnik. (2010). Nutrition and Dietetics Therapy. Biotech Pharma Publications, Hyderabad.

Pedagogy

Lecture, Demonstration, Practical, E-content.

Course designers

- Ms.E.AGALYA
- Ms.N.GANGA DEVI

SEMESTER -II	INTERNAL MARKS: 25	EXTERNAL MARKS:75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS2DSE2A	FUNCTIONAL FOODS, NUTRACEUTICALS AND NUTRIGENOMICS	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To acquire a sound understanding of the sources of functional foods and nutraceuticals
- To learn role of functional foods and nutraceuticals in health and diseases.
- To understand the concept of nutrigenomics.

Pre requisites

- Fundamentals of food science.
- Basic knowledge on nutrition and dietetics.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define and classify functional foods and nutraceuticals and its regulatory aspects	K1
CO2	Explain the techniques used for extracting functional food components from food sources	K2
CO3	Classify the isolated component derived from the functional food	K3
CO4	Ascertain mechanism of action of functional foods and nutraceuticals on health and disease	K4
CO5	Contrast the interactions between functional foods and nutrigenomics	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	-	2	2	3	3	3	3	2
CO2	3	3	-	3	3	3	3	3	3	3
CO3	3	3	-	3	3	3	3	3	3	3
CO4	3	2	-	3	3	3	3	3	3	3
CO5	3	2	-	2	2	2	3	3	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation “3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Functional Foods and Nutraceuticals Definition, Classification of functional foods based on Food source - Plant, animal, microbial. Mechanism of action - antioxidant, antibiotic, anti- inflammatory, antitumor, antihypertensive. Chemical nature - Fatty acids and structural lipids, saponins, isoflavones, phenolic substances, terpenoids, tocotrienols and simple terpenes, Isoprene derivatives, Amino acid derivatives, Carbohydrate derivatives.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Role of Functional Foods and Nutraceuticals on Health from Plant Sources: Cereals and its Products – rice bran, wheat bran, oats, barley, corn. Pulses and its Products – grams, bean, soyabean. Vegetables and Fruits – GLV, cruciferous vegetables, carrot, tomato, avocado, berries. Nuts and Oilseeds – flax seeds, walnut, almond Herbs – thyme, aloe vera, mint Roots and tubers – Ginger, sweet potato, cassava Spices and Condiments – turmeric, red chilli, nutmeg, cloves, cardamom Role of Functional Foods and Nutraceuticals on Health from Animal Sources: Meat – Liver, Country chicken Fish- tuna fish, mackerel, sardines and salmon Egg – Country egg. Role of Functional foods and nutraceuticals on health from microbial source: Probiotic microflora, prebiotics, symbiotics	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

III	<p>Role of Functional Foods and Nutraceuticals in Diseases :</p> <p>Diabetes mellitus, Hypertension, Ulcer Osteoporosis, Cancer, Obesity and Stress.</p> <p>Role of Functional Foods and Nutraceuticals in Disorder :</p> <p>Hypercholesterolemia, Neurological disorders</p> <p>Nephrological disorders, Liver disorders.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	<p>Isolation and Extraction Functional Component from Plant and Animal Materials:</p> <p>Extraction methods- Extraction of phenolic compounds using solvents, Microwave- assisted Extraction, Ultrasonic – assisted Extraction. Recent developments in the isolation, purification and delivery of phytochemicals.</p> <p>Regulatory Aspects of Functional Foods and Nutraceuticals</p> <p>Regulatory aspects- CODEX, DSHEA, FOSHU, FSSAI, AYUSH, development of biomarkers to indicate the efficacy of functional ingredients, Research frontiers in functional foods.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	<p>Nutrigenomics</p> <p>Basic concepts of Genomics and Functional Genomics, Proteomics, Metabolomics, Epigenetics and Personalized nutrition. Nutrients and gene expression with its regulation. Scope and Importance to Human Health and Industry, Transporter gene polymorphisms -interaction with effects of macro and micronutrients in humans. The intestinal microbiota - role in nutrigenomics.</p> <p>Nutrigenomics approaches to unraveling physiological effects of complex foods.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	Modifying Disease Risk through Nutrigenomics Modulating the risk of diseases through Nutrigenomics – Cardiovascular disease, Diabetes, Cancer, Inflammatory bowel disease, Obesity.			
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Difference between functional Foods and nutraceuticals. Sources of functional foods. Role of functional foods in Psoriasis. Regulatory aspects of FDA. Proteomics.	-	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5

Text Books

1. Chavan,U.D. (2017) *Nutraceutical Functional Foods – Volume I*. Daya Publishing House, New Delhi.
2. Chavan,U.D. (2017) *Nutraceutical Functional Foods– Volume II*. Daya Publishing House, New Delhi.

Reference Books

1. Pomeranz,Y (2000). *Food Analysis Theory and Practice*. CBS Publishers & Distributors Pvt.Ltd, New Delhi
2. Edward.R,Farnworth (2008). *Handbook of Fermented Functional Foods*. CRC Press. Newyork.
3. Medwin Gale (2018). *Nutrigenomics*. Random Publications, New Delhi.
4. Wildman,E.C Robert(2007). *Handbook of Nutraceuticals and Functional Foods*(2nd ed). CRC press.

Web Links

- 1.<https://www.nutritionociety.org/blog/nutrigenomics-basics>
- 2.https://faculty.ksu.edu.sa/sites/default/files/lectute_1_457_0.pdf
- 3.<https://egyankosh.ac.in/bitstream/123456789/38355/1/Uint-9.pdf>

Journals

1. Functional foods in Health and Disease, Functional food centre, Unitedstates
2. Future journal of pharmaceutical sciences, Elsevier,UnitedKingdom
3. Nutrafoods, Springer, UnitedStates.
4. Functional Foods in Health and Disease, Functional Food Center, Inc.UnitedStates.
5. International Journal of Bio-Resource and Stress Management

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment, Quiz, Group Discussion

Course Designers

- Ms.M.VINOTHINI
- Ms.S.FATHIMA

SEMESTER- II	INTERNAL MARKS:25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22PFS2DSE2B	HOUSEKEEPING AND INTERIOR DESIGNING	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To gain knowledge on the role of housekeeping departments in hospitality sector.
- To acquire skill in aspects of interior design.
- To understand the types of rooms and cleaning procedures.

Pre requisites

- Basic knowledge about food service establishments.
- Principles and elements of interior design.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Identify the concept, scope and importance of housekeeping and interior design in food service establishments	K1
CO 2	Illustrate the layout of establishment and styles of interior design	K2
CO 3	Apply the functions of housekeeping and interior design	K3
CO 4	Examine the selection and maintenance of cleaning equipment	K4
CO 5	Appraise skill in the field of housekeeping and interior design	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2	3	3	3	3	3
CO2	3	3	3	3	2	2	2	2	2	2
CO3	3	3	3	2	2	3	3	3	3	3
CO4	3	3	3	3	2	2	3	2	3	3
CO5	3	3	3	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Housekeeping Overview <ul style="list-style-type: none"> Housekeeping- Objectives, qualities and etiquette of housekeeping staff. inter and intra departmental co-ordination, role of housekeeping in hospitality and food service establishment Housekeeping procedures- Briefing, debriefing, gate pass indenting from stores- inventory of housekeeping items, housekeeping control desk, importance, check list, key control, handling lost and found, forms, formats and registers used in the control desk, paging systems and methods, handling of guest queries, problem, request, general operations of control desk, role of control desk during emergency. 	18	CO 1 CO 2 CO 3 CO 4 CO 5	K1, K2, K3, K4, K5
II	House Keeping Organization and Layout <ul style="list-style-type: none"> a.Organization - Structure of housekeeping department, job description of housekeeping personnel. operational areas of housekeeping department, sequence of housekeeping functions b.Layout- Types of guest rooms, layout of guest room, corridor and floor pantry. 	18	CO 1 CO 2 CO 3 CO 4 CO 5	K1, K2, K3, K4, K5
III	Linen Rooms and Laundry and Cleaning Science <ul style="list-style-type: none"> a. Linen Room and Laundry - Linen, Uniform, Bedding, Linen- storage and control, Table linen, bed linen, bedding, bed making and turning down, uniforms, and fabric stain removal. Laundry – Commercial, in-house, linen hire, laundry process. Uniform designing: Importance, types, characteristics, selection, par stock, Function of Tailor room. 	18	CO 1 CO 2 CO 3 CO 4 CO 5	K1, K2, K3, K4, K5

	<p>b. Cleaning science- Daily cleaning of Occupied, Departure, Vacant, Under repair, VIP rooms. Cleaning agent -types and characteristics. Stain removal Techniques. Cleaning equipment -types, Selection and care and maintenance.</p>			
IV	<p>Elements and principles of Interior Design</p> <p>a. Interior design- Importance of interior design. Design – definition, types. Elements – line, direction, form, shape, size, texture and colour. Principles- harmony, balance, rhythm, emphasis, proportion.</p> <p>b. Color –color dimensions– hue, value and intensity, color therapy and psychology. Color systems, applications of color in interior and exterior.</p>	18	CO 1 CO 2 CO 3 CO 4 CO 5	K1, K2, K3, K4, K5
V	<p>Accessories in Interior Design</p> <p>a. Accessories-meaning, types-functional, decorative. Importance of lighting, sources, types, glare- its types, causes and prevention.</p> <p>Styles of furniture – traditional, contemporary and modern design. Furniture for different purpose, furnishing materials. Selection, use and care of furnishing materials.</p> <p>b. Window Treatment - draperies, curtains type and uses.</p> <p>c. Flower arrangement- requirements, care of flowers, types and styles of flower arrangements.</p>	18	CO 1 CO 2 CO 3 CO 4 CO 5	K1, K2, K3, K4, K5

VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Difference between job description and job specification. Role of housekeeping department in a hotel. Activities of the linen room. Color harmony. Types of flower holders.	-	CO 1 CO 2 CO 3 CO 4 CO 5	K1, K2, K3, K4, K5
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Text Books

1. G. Raghubalan and Smritee Raghubalan, 2015, *Hotel Housekeeping: Operations and Management*, 3rd Edition, Oxford University Press.
2. Marilynne Robinson, 2015, *Housekeeping*, Faber & Faber Publishers.
3. Gary Gordon & Jamco L. Nuckolls, 2004, *Interior lighting for Designers*, 3rd edition, John Wiley & Sons, New York.

Reference Books

1. Allen Tate, 2005, *The making of interiors – An introduction*, - Harper & Row Publishers, New York.
2. Simon Dodsworth, 2009, *The Fundamentals of Interior Design*, Bloomsbury Academic Publishers.
3. Malini Singh, 2012, *Hotel Housekeeping*, Tata McGraw Hill Education.
4. Joan Cameron Branson, Margaret Lennox, 1988, *Hotel, Hostel and Hospital Housekeeping*. Edward Arnold Publishers.

Web links

- <https://www.emerald.com/insight/content/doi/10.1108/ijchm.2000.12.3.218.3/full/html>
- <https://www.cleanindiajournal.com/category/professional/housekeeping/>
- https://www.etsy.com/market/housekeeping_journal
- <https://idec.org/journal-of-interior-design/>
- <https://matjournals.com/Journal-of-Interior-Designing%20and-Regional-Planning.html>
- <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=Cdnwi2LUCCLzrJZ76d/o1A==>
- <https://egyankosh.ac.in/simple-search?query=housekeeping>

Journals

1. Journal of Interior design research and education
2. International Journal of Transformation in Tourism & Hospitality Management
3. Journal of Interior Design

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment.

Course Designers

- Ms. T.R. REVATHI
- Ms. C. NIVETHA

SEMESTER- II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS2DSE2C	FOOD PACKAGING	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To study about the functions of packaging along with the influence of various factors on food.
- To know about the different packaging materials, their manufacturing process and equipment.
- To study about the various methods of packaging to improve the shelf life of the products.

Pre requisites

- Basics in food science and food chemistry concepts.
- Fundamentals of food safety and laws.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	State basics in relevant to food packaging, materials and equipment	K1
CO2	Describe the different types and properties of the food packaging materials and equipment	K2
CO3	Relate packaging properties, rules and packaging techniques	K3
CO4	Associate the packaging materials and effective packaging processes	K4
CO5	Conclude food standard and laws to emphasize the importance of food safety with packaging aspects	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	1	3	3	3	3	3	3	3
CO2	2	3	1	3	3	3	3	3	3	3
CO3	3	2	1	3	3	2	3	3	3	3
CO4	2	2	1	3	3	2	2	3	3	3
CO5	2	2	1	3	3	2	2	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to food packaging Objectives, functions of packaging, requirement of effective packaging. Forms of Packaging – rigid, semi-rigid, flexible. Packaging closures and sealing systems, analysis of storage requirement, Vacuum and Inert gas Packaging. Tests on packaging materials, mechanical strength, tension, notch and tearing strengths.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
II	Materials used for food packaging Types, properties, advantages and disadvantages- Paper and paper-based Packaging materials, metal packaging materials, glass packaging materials, plastics and composites, edible and biodegradable, nano food packaging materials. Selection and Design of packaging, Material for dehydrated foods, frozen foods, dairy products, fresh fruits & vegetables, meats and sea foods.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
III	Packaging material properties Properties of packaging materials such as tensile strength, bursting strength, tearing resistance, puncture resistance, impact strength, tear strength, methods of testing and evaluation; barrier properties of packaging materials, theory of permeability, factors affecting permeability, permeability coefficient, gas transmission rate and its measurement, water vapor transmission rate and its measurement.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
IV	Packaging equipment and machinery Active packaging, Modified atmosphere packaging, aseptic packaging, packages for microwave ovens, tetra pack unit Biodegradable plastics, edible gums, coatings vacuum machine; gas packaging machine, seal and shrink packaging machine, form and fill sealing machine, aseptic packaging	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.

	systems, bottling machine, carton making machine, retort pouches, package printing machines.			
V	<p>Safety and legislative aspect of packaging</p> <p>Principles in the development of safe and protective packing, Safety assessment of food packaging materials. Shelf life of packaged food products. Migration, regulatory considerations. Indian and International Food Laws, Organizations and Affiliations -FSSAI Regulations, BIS, FDA, licensing and Registration of Food Units – Central and State Licensing Authorities. FAO & WHO – Role and Functions, World Animal Health Organization, World Trade Organization, European Committee for Standardization, European Union on Food Safety, EFSA, Euro-Asian Council for Standardization, COPANT and ASEAN, ISO – special emphasis on ISO 9001:2000/2008; ISO 22000:2005; ISO 45001; ISO 14001.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Advantages of ECO friendly - Sustainable and biodegradable packaging. Recycling of food packaging Materials. FSSAI- Function. Codex India.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.

Text Books

1. Subbulakshmi, G, Shobha A Udipi., (2006), *Food Processing and Preservation*, New Age international Publishers, New Delhi, 1st ed.,
2. Dr Birendra Kumar Mishra., (2014), *Dairy and Food Processing Industry: Recent Trends*, Biotech Books, ISBN-10 817622300 :
3. Sivasankar.B., *Food Processing and Preservation*, Prentice Hall of India Pvt. Ltd., New Delhi.

Reference Books

1. Kees A., van der Heijden and Sanford Miller- *International Food Safety Handbook: Science, International Regulation, and Control*. Published by CRC Press. ISBN 0824793544, 9780824793548. 1999.
2. Neal D. Fortin., (2016) *Food Regulation Law, Science, Policy, and Practice*. Wiley
3. Gordon L. Robertson, *Food Packaging: Principles and Practice*, Third Edition, 2013.
4. Potter N, and Hotchkiss J.H., (2008) *Food Science*. CBS Publications and Distributors, New Delhi
5. Srilakshmi B, (2016) *Food Science*. New Age International Publishers, New Delhi
6. Joslyn and Heid, (2018) *Food Processing Operations: Management, Machines, Materials & Methods*. Vol. 1, Medtec (1 January 2018), ISBN-10 : 9789386800688

Web links

1. <https://matmatch.com/learn/material/materials-used-in-food-packaging>
2. <https://pubs.acs.org/doi/10.1021/jf900040r>

Journals

1. Journal of Packaging Technology and Research, Springer
2. Floros JD, Matsos KI. Introduction to modified atmosphere packaging. In: *Innovations in Food Packaging* (New York, NY: Elsevier Academic Press). p. 159–72. Public Health Nutrition, Cambridge University, England
3. Food Research International, Elsevier Science Inc, United States.
4. Journal of Food and Agriculture, Wiley-Blackwell, England

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar, Visit to food packaging industry.

Course Designers

- Ms. T.R. REVATHI
- Ms. M. VINOTHINI

SEMESTER- II	INTERNAL MARKS: 40		EXTERNAL MARKS: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS2INT	INTERNSHIP	INTERNSHIP	-	2

Course Objectives

- To understand working operational aspects of dietary department in hospitals.
- To Plan modified diet according to special needs of patients.
- To learn role of Dietitian in hospitals.

Pre requisites

- Basic knowledge on various disease condition.
- Fundamental aspects of therapeutic diets.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Label functions of dietary department in hospitals	K1
CO2	Illustrate the organization pattern of dietary department	K2
CO3	Prepare routine hospital diets	K3
CO4	Predict modified diet according to special condition	K4
CO5	Compare role tools for patient education	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	3	2
CO3	3	3	3	3	3	3	3	3	3	2
CO4	3	3	3	3	3	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation.

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

DIETARY INTERNSHIP

SYLLABUS

The Practical work consists of internship in a IDA recognized hospital for 30 days

- Observe different areas in dietary department.
- Visit different areas in wards and hospitals.
- Experience in planning and calculating modified diets.
- Supervising and handling the food preparation and service in the dietary department of the hospital.
- Accompanying the dietitian while visiting the patient.
- Learn to use software used in dietary department.
- Develop tools for diet counseling.
- Acquire the skills to provide individual counseling.
- Case study- Selecting and observing patients requiring a therapeutic diet in relation to patients history - income, occupation, food habits, social factors, nutritional status, disease conditions and complications
- Waste management
- Energy effective technologies.

Preparation of the report should include

- History of the hospital
- Location
- Facilities provided
- Layout of the kitchen
- Work organization
- Organization structure
- Duties of the dietitian
- Special dietary preparation
- Menus
- Types of service
- Equipment
- Storage of food
- Handling of leftovers and shortages
- Sanitation and hygiene

Text Books

1. Shubhangini A Joshi (2010). *Nutrition and Dietetics* McGraw Hill Education private Limited, New Delhi
2. Gopalan C Rama Sastri V and BalasubramaniyanC (2016) *Nutritive value of Indian Foods*, National Institute of Nutrition, Hyderabad.

Reference Books

1. Joshi Y K(2003).*Basis of Clinical Nutrition*, Jaypee Brothers Medical Publishers

Web Links

- 1.<https://egyankosh.ac.in/handle/123456789/32940>
- 2.<https://egyankosh.ac.in/handle/123456789/33414>

Pedagogy

Lecture, Demonstration, Internship

Course Designers

- Ms.S.FATHIMA
- Ms.M.VINOTHINI

SEMESTER III	INTERNAL MARKS: 25	EXTERNAL MARKS:75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS3CC6	FOOD PRODUCT DEVELOPMENT AND ENTREPRENEURSHIP	CORE	6	5

Course Objectives

- To acquire knowledge on food processing
- To understand the need for a new product through surveys and consumer data
- To know about various types of marketing strategy involved in generating sales for a new product.

Pre-requisites

- Fundamentals of food chemistry
- Basic knowledge on food science

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On Successful Completion of the course, students will be able to	
CO1	Define the principles and sketch appropriate processing technology to create a new food product	K1
CO2	Explain the evaluation procedures involved in food product development	K2
CO3	Relate the role of food packaging and importance of labeling on developed food product	K3
CO4	Determine financial sources for entrepreneurial ventures for a new product development	K4
CO5	Evaluate commercialization of a new food product	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	3	3	3	3	3
CO2	3	3	2	3	3	3	3	3	3	3
CO3	3	3	2	3	3	3	3	3	3	3
CO4	3	3	2	3	3	3	3	3	3	3
CO5	3	3	2	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	a) Food product development Principles, steps in food product development, factors influencing food product development- social concerns, impact of technology and market place influence. Market research, consumer preferences. b) Generation of new product ideas Internal sources of ideas-census data, magazine, reward cards, surveys. Polling, membership list, seller/retailer and distributor, telephone and mails. External sources of ideas- competitors, food conference/exhibition, tradeshow and research symposia, public libraries, trade literature, Government publications.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
II	a) Food processing Principle, methods of food processing. Trends in modern food processing. b) Recipe development Types – Fresh and processed foods. Traditional foods, weaning foods, convenience foods (RTE, RTS), extruded foods, fabricated foods, value added foods, designer foods, sports foods, space foods, functional foods. Standardization methods, portion size and portion control.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
III	a) Sensory evaluation Sensory evaluation, nutrient analysis, shelf life and storage stability evaluation procedure of developed food products, b)Objective evaluation Tests used for Objective Evaluation-Chemical methods, Physico-chemical methods, Microscopic Examination, Physical Methods.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
IV	a)Packaging Types of packaging, steps to determining packaging, food	18	CO1, CO2, CO3,	K1,K2,K3,K4,K5

	<p>packaging materials and forms, package testing, packages with special features, safety of food packaging. Food labeling and nutrition labeling.</p> <p>b)Food Standards</p> <p>Food Standards – ISO 9000 quality management systems, FSSAI, AGMARK, FAO, WHO, ISO 2200 series.</p>		CO4, CO5	
V	<p>a)Financial management, and marketing</p> <p>Pricing- objectives, methods of pricing, Financial accounting procedures, food product cost calculation, profit margin. Role of advertisement in promotion of new products, marketing strategies.</p> <p>b) Entrepreneurship</p> <p>Introduction, concept, characteristics, entrepreneurial process, importance of entrepreneurship, factors affecting entrepreneurship. Entrepreneur – types, functions of an entrepreneur. Financial sources for entrepreneurial ventures. Role of institutions – MSME,SIDCO, SIDBI, NIESBUD, EDII, SISI, NREG, Scheme-SWARNA JAYANTHI, Rosgar Yojana Schemes, Bank/Funding agencies. Legal environment and entrepreneurship- patents, copyrights, trademarks.</p>	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Factors influencing food product development- health concerns, Types and uses of food additives, SWOT analysis, Role of FSSAI in licensing, Factors affecting pricing.</p>	-	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5

TextBooks

1. Avantina Sharma. (2012). *Textbook of Food Science and Technology*. CBS Publishers and Distributors Pvt.Ltd.
2. N.Shakunthala Manay M.Shadakshara swamy. (2008). *Food Facts and Principles*. New Age International Publishers, NewDelhi.
3. Vikas Ahluwalia. (2007). *Food Processing*. Paragon International Publishers, New Delhi.
4. Ernest R.Vieira. (2010). *Elementary Food Science*. International Thomson Publishing, New York.

ReferenceBooks

1. Gordon W.Fuller. (2011). *New Food Product Development From Concept to Market Place*, CRC Press.
2. Sunetra Roday. (2012). *Food Hygiene and Sanitation*. Tata McGraw Hill Education Private Limited, New Delhi.
3. D.G.Rao. (2016). *Fundamentals of Food Engineering*. PHI Learning Private Limited, New Delhi.

Web links

- <https://egyankosh.ac.in/bitstream/123456789/33557/1/unit-14.pdf>
- https://www.academia.edu/40644146/New_Food_Product_Development
- <https://books.google.co.in/books?id=MnGtY1PwrIoC&pg=PA161&lpg=PA161&dq=recipe+development+process+RTE+%26+RTS&source#v=onepage&q&f=false>
- <https://www.mdpi.com/2304-8158/9/9/1317>

Journals

1. International Journal of Engineering Science and Technology, Engg Journals Publications, Singapore.
2. Current Research in Nutrition and Food Science, Enviro Research Publishers, Madhya Pradesh, India

Pedagogy

E-content, Lecture, Power Point Presentation, Seminar, Assignment, Visit to Food Processing and Packaging units.

Course Designers

- Ms.M.VINOTHINI
- Ms.T.R.REVATHI

SEMESTER III	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS3CC7	RESEARCH METHODS, STATISTICAL TECHNIQUES AND COMPUTER APPLICATIONS	CORE	6	5

Course Objectives

- To understand the various categories of researches
- To ascertain and accomplish different research
- To apply computer techniques in data analysis

Pre – requisites

- Fundamental knowledge on nutritional problems and vital statistics
- Basic knowledge in operating systems and application of software

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On Successful Completion of the course, students will be able to	
CO1	Identify the problem and select appropriate type of research	K1
CO2	Illustrate the data processing using diagrammatic and graphical representation	K2
CO3	Apply sampling techniques and apply the same for thesis and report writing	K3
CO4	Analyze statistical distribution and apply it for tests of significance using Statistical Package for the Social Sciences (SPSS) software	K4
CO5	Assess central tendency variation and relate the results	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	2	2	2	2	2	2	2
CO2	2	2	2	2	2	2	2	2	2	2
CO3	2	2	2	2	2	2	2	2	2	2
CO4	2	2	2	2	2	2	2	2	2	2
CO5	2	2	2	2	2	2	2	2	2	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	<p>a) Introduction to research and types of research Definition, Objectives, characteristics of research and criteria of good research. Different types of Research- Descriptive, Analytical, Applied, Fundamental, Quantitative, Qualitative, Conceptual and Empirical research.</p> <p>b) Nutrition research and experimental design Principles of Research Design, longitudinal, cross sectional, epidemiological, surveillance, retrospective, in-vivo, in- vitro. Experimental Design– Single group, pre and post design, case study, ex-post facto, time series, experiments and factorial design.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	<p>a) Sampling techniques Different sampling Methods-Probability and non-probability sampling methods. Sampling and non-sampling errors, sample size, sampling fundamentals and theory of sampling.</p> <p>b) Scaling techniques Different types – Nominal, Ordinal, Interval and ratio – attitude Scales – Rating scales, check list.</p> <p>c) Collection of data Primary and secondary data. Primary data collection methods - preparation of schedules and questionnaires. Interview method of enquiry, training of interviewers. Secondary data collection method- Reliability of data, suitability of data, adequacy of data.</p>	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

III	<p>a) Processing of data Questionnaire checking, editing, coding, Classification- Geographical, chronological, qualitative, quantitative. Frequency distribution- discrete and continuous. Tabulation of data, parts of a table, rules of tabulation, types of tables-simple and complex.</p> <p>b) Diagrammatic and graphical representation of data Diagrammatic–One dimensional diagrams - Bar diagrams – simple, multiple, subdivided, deviation. Two dimensional diagrams- pie, circles, rectangles and squares- pictogram and carto graphs. Graphical, frequency graphs- Line, polygon, curve. Histogram- cumulative frequency graphs-ogives.</p> <p>c)Statistics in research Measures of central tendency -Mean, median, mode, their relative advantages and disadvantages. Measures of dispersion, mean deviation, standard deviation, coefficient of variation, percentiles and percentile ranks. Correlation and regression- Correlation, co efficient of correlation and its interpretation, rank correlation. Regression equations and predictions. (Include problems)</p>	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	<p>a) Probability and distributions Rules of probability and its applications, importance of these distributions in research studies</p> <p>b) Tests of significance Large and small samples, “t” and F tests, tests for independence using chi square, analysis of variance (ANOVA), analysis of covariance (ANOCOVA) and applications, Parametric and Non – Parametric Test.</p> <p>c)Computer Applications Role of computers -design and planning phase, sample size calculation, data storage and data analysis.</p>	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	<p>a) Research report writing Components or layout of a thesis - Introduction, review of literature, methodology, results and discussion, summary</p>	15	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5

	<p>and conclusion, bibliography, footnotes and appendix. Difference between Dissertation and thesis. Technical reports, popular reports, manuscript writing – original, review article, abstract, research article.</p> <p>b)Research ethics</p> <p>Principles of research ethics, scientific conduct, publication ethics, publication misconduct.</p>		CO5	
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Difference between qualitative and quantitative research,</p> <p>Preparation of questionnaire for primary data collection,</p> <p>Difference between diagram and graph.</p> <p>Role of computers in research,</p> <p>Population test, Socio economic indices, KAP Surveys.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text books

1. Kothari. G.R. (2004) *Research Methodology*. New Age International (P) Ltd, New Delhi.
2. Dr. Rajamohan S., etal., (2010) *Introduction to Statistics*, (2nded). Learn tech Press.
3. Saravanavel. P.(2013) *Research Methodology* Kitab Mahal Allahabad
4. Dr.Vijay Upagade etal., (2020). *Research Mehtodology*. S.Chand and Company Ltd., New Delhi.
5. Pillai Bahavathi .R.S.N., (2021).*Statistics Theory and Practice*. (8thed) S.Chand and company Ltd., New Delhi.

Reference books

1. Vijayalakshmi.G & Sivapragasam. C. (2008).*Research Methodology*. MJP Publishers.
2. Borse. M.N.(2004).*Hand Book of Research Methodology*. Shree Niwas publications,Jaipur, India.
3. Grumani. N.(2014)*Research Methodologyfor Biological Sciences*. MJP Publishers.
4. Ramadas R and A.Wilson (2014)*Research and Writing*. MJP Publishers.
5. Gupta. S.P.(2002)*Statistical Methods*, Sultan Chand & Sons, New Delhi.

Web links

- <http://mospi.nic.in/419-market-research-surveys>
- http://shodhganga.inflibnet.ac.in/bitstream/10603/2019/8/08_chapter-1.pdf
- <https://swayam.gov.in/courses/5143-research-methodology>
- <http://icssr.org/>

Journals

1. BMC Medical Research Methodology, Biomed Central Ltd, England.
2. Health Services and outcomes Research Methodology, Kluwer Acedemic Publishers, Netherlands.
3. International Journal of Social Research Methodology: Theory and Practice, Taylor& Francis United Kingdom
4. Research Methodology in Strategy and Management, Elsevier Bv, Netherlands.

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment.

Course Designers

- Ms. S.FATHIMA
- Ms. E.AGALYA

SEMESTER III	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23PFS3CCC2B	FOOD PRESERVATION	CORE CHOICE	5	4

Objectives

- To Gain knowledge on principles of food preservation.
- To enable students to understand the types of spoilage occurring in foods.
- To learn important methods of food preservation to ensure the quality of processed food.

Pre requisites

- Fundamentals of food science.
- Basic principles of food preservation.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Identify the principles and practices of food preservation	K1
CO 2	Describe the novel technologies in the preservation of foods	K2
CO 3	Explain the use of various preservation techniques in food processing industries.	K2
CO 4	Determine the method of action of different preservatives.	K4
CO 5	Distinguish the characteristics of additives and their specific use in foods.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	3	3	3	3	3
CO2	3	3	2	3	3	3	3	3	3	3
CO3	3	3	2	3	3	3	3	3	3	3
CO4	3	3	2	3	3	3	3	3	3	3
CO5	3	3	2	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation “3” – Substantial (High) Correlation “-” indicates there is no correlation.

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>a. Basic principles of food preservation – Definition and importance of food preservation, classification of food on the basis of pH value and moisture content. Basic principles of food preservation.</p> <p>b. Food preservation using high temperature – Moist and Dry heat methods, Blanching, Dehydration, Canning, Commercial sterilization, Pasteurization.</p> <p>c. Food preservation using low temperature- Cold Preservation -Freezing and Refrigeration - Air freezing, Indirect contact freezing, Immersion freezing, Dehydro-freezing, Cryo-freezing. Changes in foods during refrigeration and frozen storage.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	<p>a. Food preservation by drying/dehydration- Definition, concept of water activity, factors affecting drying, Drying curve (constant rate period and falling rate period), moisture content (wet basis and dry basis), equilibrium moisture content, Drying equipment- solar dryer, Cabinet dryer, tunnel dryer, spray dryer, freeze dryer, fluidized bed dryer, Flat bed dryer. Nutritional, physico-chemical changes during drying.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	<p>a. Food preservation using chemicals - Types of chemical preservatives, advantages and disadvantages, permissible limits.</p> <p>b. Food preservation by use of Food Additives – Uses of Food Additives, Intentional and unintentional food additives, Laws and regulations.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	<p>a. Food preservation by use of Ionizing radiation- Units of radiation, kinds of ionizing radiations used in food irradiation, mechanism of action, uses of radiation in food industry, concept of cold sterilization.</p> <p>b. Food preservation by use of fermentation - Benefits and mechanism of fermentation, Fermented food products e.g Beer, Wine, Soya sauce, Cheese, Sauerkraut, Kefir, Kombucha, Kimchi, Soya bean products. Microbial vs Industrial fermentation.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	a. Traditional methods of food preservation – Smoking, Sun drying, Pickling/ Salting b. Recent advances in food preservation - Pulse electric field special packaging, ohmic heating, IR heating, inductive heating, pulsed X-rays, Hurdle technology, Cold press technology.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Explore techniques to extend the shelf life of preserved foods, Vacuum sealing, Relate sustainable development goals with food packaging, Novel food preservation techniques, Preservation at home level.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Srilakshmi B. (2007), *Food Science* (4th ed) New Age International (P) Limited, New Delhi.
2. Subhulakshmi G., Udipi A. Shobha and Ghugre S. Padmini (2021), *Food Processing and Preservation* (2nd Edition) New Age International Publishers, New Delhi.
3. Sankhla A., Mogra R. and Avinash P (2014) *A Practical Guide to Food Preservation* (1st ed) Agrotech Publishing Academy, Udaipur.

Reference Books

1. Manoranjan Kalia(2014)*Food Quality Management* (2nd ed), Agrotech Publishing Academy, Udaipur.
2. Potter N *Food Technology*, (5th ed), Cornell University, Ithaca, New York.

Weblinks

- <https://nchfp.uga.edu/#gsc.tab=0>
- <https://www.terrafoodtech.com/en/food-preservation-methods-comparison/>
- <https://www.ndsu.edu/agriculture/extension/extension-topics/food-and-nutrition/food-preservation-and-wild-game>

Journals

1. Journal of Food Processing and Preservation
2. Trends in Food Science and Technology
3. International Journal of Food Science and Technology

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment, Quiz, Group, Discussion, Visit to food processing industry.

Course Designers

- Ms. T. R. REVATHI
- Ms. C. NIVETHA

SEMESTER III	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS3CCC2C	FOOD SERVICE FACILITIES	CORE CHOICE	5	4

Course Objectives

- To understand the organization and management of Food Service Institutions
- To gain knowledge on principles and functions of management
- To study the importance of tools of management

Pre -requisites

- Principles of management
- Basics in layout designing

Course Outcome and Cognitive Level Mapping

CO number	CO statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	State space allocation and layout in commercial and non-commercial establishments	K1
CO 2	Illustrate classification, selection, care and maintenance of equipment and furnishing	K2
CO 3	Predict menu planning and different types of food service systems using computers	K3
CO 4	Infer and apply computer techniques in purchase, storage, production of foods and housekeeping requirements	K4
CO 5	Assess cost control and accounting	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	3	3	2	2	3
CO2	3	3	2	3	3	2	3	2	2	3
CO3	3	3	2	3	3	3	3	2	2	3
CO4	3	3	2	3	3	3	3	2	2	3
CO5	3	3	2	3	3	3	3	2	2	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to Food Service Review of Location, architectural considerations, space allocation, design, work flow in all types of commercial and welfare food service institutions, housekeeping requirements in relation to size, work and storage heights, sanitation and safety.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Facility planning and layout Planning and organizing space relationships and arrangement of equipment with assembly line concept. Detailed layout and location of functional areas in relation to capacity, receipt, purchase and storage of food, food production, food service, removal of soiled dishes, hand washing and dishwashing. Food safety - Sanitation of plant, garbage disposal and pest control.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Equipment Review of classification, traditional and modern equipment, Features of equipment. Equipment needs for commercial and welfare food service institutions of varying capacities. Materials used as bases and finishes of equipment construction. Factors affecting selection of equipment. Care and maintenance of equipment.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Catering Systems Recent trends versus traditional, conventional, commissary, ready prepared (cook- chill /cook - freeze systems), assembly food service systems, cloud kitchen.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	Automation in the Hospitality Industry Advantage of using computers in menu planning and accounting functions of food service institutions. Types of computer systems used for reservation systems, Point of sale systems (POS) and Property management systems (PMS).Room rate structure, guest accounting, night audit, kitchen audit.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Classification of food service institutions, Ergonomics, Types of equipment, Concept of Heating , Ventilation and Air conditioning (HVAC) in food service facilities, Role of computers in hospitality industry.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Ahmed Ismail.(2004).*Front Office Operations and Management*. Delmar Publications, Singapore.
2. Premavathy N.(2008).*Principles of Management (Business Management)*. Sri Vishnu Publication.
3. Raghubalan G and Smritee Raghubalan.(2009).*Hotel Housekeeping - Operations and Management*. Oxford University Press, New Delhi.
4. Mohini Sethi.(2011).*Catering Management – An Integrated approach*. New Age International Pvt Ltd, New Delhi.

Reference Books

1. West and B.B.Wood.(1996).*Food Service in Institutions*. Jonewiley and sons.
2. Malhotra R K.(1998).*Fundamentals of Hotel Management*. Anmol Publications, New Delhi.
3. Sharma Jyothi S.(2006).*Catering Management Practices*. Akansha Publishing house, New Delhi.
4. Chakravarthi B K,(2011).*Hotel and Hospitality Management*. A.P.H.Publishing Corporation.
5. Anil Bhat.(2016).*Principles of Management competencies, Practices, Processes*. Oxford University Press, NewDelhi.
6. Peter Jones.(2016).*Food service operations*. Library Cataloguing in Publishing Data, London.
7. Singaravelan R.(2016).*Food and Beverage Service*. Oxford university Press, NewDelhi.

Web Links

- <http://ncert.nic.in/textbook/pdf/lehe104.pdf>
- <https://pdfs.semanticscholar.org/18b8/eb1b94af18401e4610673e3f8bd6120f38fc.pdf>
- https://nptel.ac.in/courses/122106031/slides/1_1s.pdf
- http://shodhganga.inflibnet.ac.in/bitstream/10603/197548/5/05_chapter%202.pdf
- <https://www.manage.gov.in/studymaterial/EC.pdf>
- <https://www.food.gov.uk/sites/default/files/media/document/food-safety-checklist.pdf>

Journals

1. Journal of Industrial Engineering and Management, [OmniaScience](#).
2. Journal of Food Service Business Research, Taylor and Francis, UnitedKingdom.
3. Journal of Hotel and Business Management, Longdom Publishing,Belgium.

Pedagogy

Lecture, Assignment, Seminar, Quiz, Power point Presentation, Visit to Commercial and Non Commercial Food Service Establishments.

Course Designers

- Ms. E.AGALYA
- Ms.M.VINOTHINI

SEMESTER III	INTERNAL MARKS:40		EXTERNAL MARKS:60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
23PFS3CC3P	RESEARCH METHODS, STATISTICAL TECHNIQUES AND COMPUTER APPLICATIONS (P)	CORE PRACTICAL - III	5	4

Course Objectives

- To understand the various process of research.
- To ascertain and accomplish different analysis involved in research.
- To apply computer techniques in data analysis.

Pre – requisites

- Fundamental knowledge on nutritional problems and vital statistics
- Basic knowledge in operating systems and application software

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	On the successful completion of the course, students will be able to State the role of questionnaire and interview schedule for major and minor projects.	K1
CO 2	Design effective visual representations of data using various graphical tools.	K2
CO 3	Apply various statistical methods to analyze and interpret data using operating system and application software.	K3
CO 4	Examine instances of plagiarism in research articles and understand the ethical implications.	K4
CO 5	Evaluate research studies that utilize different statistical methods, including bivariate correction, non -parametric tests and multiple regression analysis.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	1	1	2	-	1	1	2	2	1
CO2	2	1	1	2	-	1	1	2	2	1
CO3	2	1	1	2	-	1	1	2	2	1
CO4	2	1	1	2	-	1	1	2	2	1
CO5	2	1	1	2	-	1	1	2	2	1

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no correlation.

List of Experiments

1. Formulation of Interview schedule / Questionnaire.
2. Processing of data -editing, coding, classification and tabulation.
3. Applying Excel for nutritive value calculation and formatting chart and encryption of document.
4. Data Analysis - Computation of Mean, Median, Standard deviation.
5. Data Analysis – Graphical and diagrammatic representation of data.
6. . Bi Variate correlation.
7. The t -test procedure using SPSS.
8. Non -parametric test -Chi-square test.
9. One way ANOVA procedure using SPSS.
10. Simple Regression, Multiple Regression.
11. Identification of Indexed journal.
12. Research proposal preparation.
13. Check plagiarism using software.

Text Books

1. Kothari G.R.(2004).Research Methodology. New Age International (P) Ltd.
2. Dr.Rajamohan.S. and Thilagaraj A.(2010).Introduction to Statistics(2nded). Learntech Press.
3. Saravanavel P. (2013).Research Methodology.Kitab Mahal Allahabad.

Reference Books

1. VijayalakshmiG. and Sivapragasam .C. (2008)Research Methodology. MJP Publishers.
2. Borse. M. N. (2004).Hand Book of Research Methodology. Shree Niwas publications,Jaipur(India).
3. Grumani N.(2014).Research Methodology for Biological Sciences. MJP Publishers.
4. Ramadas. R. and Wilson. A.(2014)Research and Writing. MJP Publishers.
5. Gupta S. P.(2002)Statistical Methods. Sultan Chand & Sons, New Delhi.
6. Chawla D. and Sondhi N. (2016).Research Methodology. Vikas.
7. Paneersevam. R. Research Methodology.Prentice Hall India Learning Private Limited.

Web links

- <http://mospi.nic.in/419-market-research-surveys>
- http://shodhganga.inflibnet.ac.in/bitstream/10603/2019/8/08_chapter-1.pdf
- <https://swayam.gov.in/courses/5143-research-methodology>
- <http://icssr.org/>

Pedagogy

E- Content, Power Point Presentation, Demonstration

Course Designers

- Ms. S. FATHIMA

SEMESTER III	INTERNAL MARKS : -	EXTERNAL MARKS: 100		
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDIT
22PFS3DSE3A	COMPETITIVE EXAMINATIONS IN HOME SCIENCE FOR PROFESSIONAL DEVELOPMENT	DISCIPLINE SPECIFIC ELECTIVE	5	3

Course Objectives

- To understand the basic concepts of home science
- To enable the students for competitive exams
- To enhance life skills

Pre-requisites

- Basics in Nutrition and Dietetics
- Principles of Home Science

Course Outcome and Cognitive Level Mapping

CO Number	CO statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	State the principles involved in food science, food standards and diet therapy	K1
CO2	Illustrate malnutrition, ecological factors, nutritional problems and their management	K2
CO3	Apply resource management, consumer issues, fundamentals of design in housing and apparel designing	K3
CO4	Associate appropriate communication tools with extension education	K4
CO5	Evaluate physical and physiological human development with respect to family relationship	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	1	3	-	3	2	-	2	3
CO2	3	2	1	3	2	3	2	-	2	3
CO3	3	2	1	3	3	3	2	-	2	3
CO4	3	2	1	3	-	3	2	-	2	3
CO5	3	2	1	3	2	3	2	-	2	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Food Science, Food Service Management, Nutrition and Dietetics</p> <p>Food Science -Properties of food, quality evaluation of food, new product development, food packaging.</p> <p>Food Service Management- Menu planning, food cost analysis. Food standards, microbiological safety of food, HACCP. Perspectives of foodservice nanotechnology.</p> <p>Nutrition and Dietetics – Principles of nutrition, nutrition through lifespan, community nutrition, sports nutrition, nutrition in emergencies and disasters, nutritional intervention, clinical and therapeutic nutrition.</p>	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	<p>Textiles, Apparel Designing</p> <p>Textiles- Textile terminologies, classification of fibres, yarns and weaves, identification of fibres and weaves. Manufacturing process, properties and their uses. Fabric construction their properties and uses. Textiles finishes-classification, processing and purposes of finishes. Types of dyeing and printing. Textile testing and quality control, textile and environment. Traditional textiles of India. Recent developments in textiles.</p> <p>Apparel designing - Body measurements, equipment and tools used for manufacturing garments, elements and principles of design and its application to apparel. Factors affecting fashion, patternmaking, apparel manufacturing and quality testing. Care and maintenance of clothing.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	<p>Resource Management and Consumer Issues, Housing and Interior Design</p> <p>Resource Management-Management of time, energy, money, space, motivating factors, motivation theories, decision making, functions of management. Management of natural resources, money management, human resource management, ergonomics.</p> <p>Consumer Issues-Definition, role, rights and responsibilities, consumer behaviour,</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	<p>consumer problems, education and empowerment. Consumer protection and legislation. Entrepreneurship-concept, process, barriers, entrepreneurial motivation, challenges, enterprise setting, project planning and appraisal, enterprise management, Food economics.</p> <p>Housing and Interior Design</p> <p>Housing - Building regulations, Furniture and furnishing, housing finance, Housing and environment. Design – principles, elements of interior design.</p>			
IV	<p>Child / Human Development, Family Studies</p> <p>Child Development - Theories of human development and behaviour. Children and persons with special needs, care and support, special education, prevention of disabilities, rehabilitation. Children at risk-child labour, street children, children of destitute, orphans, child abuse and trafficking.</p> <p>Family Studies</p> <p>Family studies - Dynamics of marriage and family relationships. Role of family welfare in national development. Domestic violence, marital disharmony, resolution of conflict. Parent education, positive parenting, community education. Family disorganization.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	<p>Communication for Development, Extension Management and Community Development</p> <p>Communication for Development -Basics of communication- nature, characteristics, functions, process, models, elements, principles, barriers, perception, persuasion and empathy, types of communication, levels (settings) of communication transactions, process of listening. Communication systems and communication theories. Role of communication in development-Theories, models, need and importance. Writing for development, social marketing. Traditional, modern and new media for development. Theories in advocacy and behaviour change.</p> <p>Extension Management and Community Development</p> <p>Programme management, Extension</p>	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	<p>methods and materials, Curriculum development and planning for extension education and development activities, Bloom's taxonomy of educational objectives and learning. Non- Formal, adult and lifelong education- perspectives, concept, theories, approaches, scope, methods and materials used, challenges of implementation and evaluation, issues to be addressed. Training, skill development and capacity building for human resource development-methods of training, entrepreneurship development. Community development, programmes for nutrition, health and education, People's participation and stakeholders perspectives, Participatory Learning and Action-methods and techniques.</p>			
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Nutritional assessment-methods and techniques, Selection of clothing for different age groups. Selection of fabrics for different uses, Energy management and national efforts on energy conservation, Growth and development during pregnancy, History and objectives of extension education and extension service.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Trueman Team. (2019). NTA–UGCNET. Home Science. Danika Publishing Company.
2. Upkar Prakasan. (2015) .Upkar’s UGCNET/JRF Exam. Solved Papers Home Science, Pratiyogita Darpan.
3. Premalatha Mullick. (2012). Textbook of Home Science.Kalyani Publishers.

Reference Books

1. Atlantic Research Division. (2014). Home Science forUGC-NET/SLET/JRF. Atlantic Publishers & Distributors PvtLtd.
2. Nandini Sharma. (2019). NTA UGCNET/JRF/SET. Home Science.Arihant publisher.
3. Editorial Board. (2019). NTAUGC-NET/JRF. Solved Papers.Home Science, Sahitya Bhawan.
4. Sunita Mishra. (2013). UGC NET Study Manual. Home Science. Selective and Scientific Books.

Weblinks

- <https://www.examrace.com/NTA-UGC-NET/NTA-UGC-NET-Previous-Years-Papers/Home-Science/>
- <http://www.deepugcnet.com/home-science.html>
- <http://www.ugcnetjrf.com/ugc-net-home-science-study-materials.html><https://iasexamportal.com/Download/UGC-NET-Previous-Year-Exam-Question-Paper-Home-Science>

Journal

1. Food Science and Nutrition, John Wiley and Sons Ltd publisher, United Kingdom.
2. Nutrition in Clinical Practice, Sage Publications Inc, United States
3. Journal of Early Childhood, SAGE journal,United States.
4. International Journal of Home Science, Tirupati journal solutions, New Delhi.

Pedagogy

Lecture, Seminar, Assignment, Power Point Presentation, E-Content.

Course Designers

- Ms.S.FATHIMA
- Ms.M.VINOTHINI
- Ms.E.AGALYA

SEMESTER III	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDIT
22PFS3DSE3B	WASTE MANAGEMENT IN FOOD INDUSTRIES	DISCIPLINE SPECIFIC ELECTIVE	5	3

Course Objectives

- To know the waste emission of food industries
- To understand waste treatment method in food industries
- Importance of treating waste product from food industry

Pre -requisites

- Fundamentals of food science
- Basic knowledge on food processing

Course Outcome and Cognitive Level Mapping

CO Number	CO statement On the successful completion of the course, students will be able to:	Cognitive Level
CO1	Identify the basic principles of waste in food industries	K1
CO2	Describe the types of waste generated in various food industries	K2
CO3	Predict the methods of various waste treatment	K3
CO4	Determine the methods of utilizing wastes to make value added product	K4
CO5	Evaluate the recent trends in managing the waste food industries	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	-	3	3	-	3	3
CO2	3	3	3	2	-	3	3	-	3	3
CO3	3	3	3	2	-	3	3	-	3	3
CO4	3	3	3	2	-	3	3	-	3	3
CO5	3	3	3	2	-	3	3	-	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Waste management overview Introduction, classification and characterization of food industrial wastes from fruits and vegetable processing industry, beverage industry, fish, poultry meat , sugar and dairy industry.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Waste from food processing industry Introduction and types of waste generated; bio degradable, non-degradable wastes, food industrial wastes from fruits, vegetables processing industry, fish, meat , poultry and dairy industry.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Treatment methods of waste from food industry Treatment methods for liquid waste from food industry- Design of activated sludge process, bioremediation, trickling filter process and anaerobic, design of solid waste treatment methods from food industry-drying, incineration and Solid waste storage and disposal methods- land-filling, burial, incineration, vermin composting pit, recycling. Hospital waste management-Infectious, hazardous, radioactive and general.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Emerging trends in waste management Utilization of waste- methods of utilizing wastes to make value added products; pectin, food colorants, antioxidants from fruit peels (citrus, mango, pomegranate), lycopene from tomato peels, enzymes from meat processing. Recovery and reuse of trimmings and pulps from fruit and vegetable.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	Regulatory issues with food industry waste International and national scenario on disposal of waste from food industries, Regulatory issues with food industry waste. environmental impact assessment, ISO 14000.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) General characterization of food industry wastes, Types of waste generated from fruits and vegetables, Uses of recycling methods in food processing industry, Relate food waste management with nutraceuticals, Characterization of regulatory issues with food industry waste.	-	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5

Text Books

1. Ioannis S. Arvanitoyannis (2008). *Waste management for the food Industry*. (1sted). Elsevier Academic Press, United Kingdom
2. V. K. Joshi (2011). *Food processing waste management: Treatment and utilization*. (1sted) India Publishing Agency, New Delhi
3. Sivasankar B. “*Food processing and preservation*. (1sted) Prentice Hall of India Pvt. Ltd., New Delhi.

Reference Books

1. Keith Waldron (2009). *Hand book of waste management and co product recovery in food processing volume 2*. (1sted).CRC Press. Wood head publishing Limited. New Delhi.
2. Maria Kosseva, Colin Webb (2013). *Food industry waste assessment and recuperation of commodities*, (2nded)Elsevier, Unites States of America
3. Monika Thakur, V. K. Modi, Renu Khedkar (2021). *Sustainable food waste management: Concepts and Innovation*. (1sted).Springer.
4. Herzka A & Booth RG (1981), *Food Industry Wastes: Disposal and Recovery*. (1sted). Applied Science Pub Ltd, London

Weblinks

- <https://egyankosh.ac.in/handle/123456789/12399>
- <https://www.pdfdrive.com/waste-management-for-the-food-industries-food-science-and-technology-food-science-and-technology-e184360163.html>
- <https://swayam.gov.in/> Category: Engineering & Technology. Sub Category: Agriculture and Food Engineering

Journals

1. Journal of Material Cycles and Waste Management, Springer.
2. International journal integrated waste management, Science and Technology, Elsevier.

Pedagogy

Lecture by chalk & talk, power point presentation, e-content, group discussion, assignment, quiz, seminar.

Course Designers

- Ms. T.R. REVATHI
- Ms. R. ARTHY

SEMESTER III	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDIT
22PFS3DSE3C	CHILD DEVELOPMENT	DISCIPLINE SPECIFIC ELECTIVE	5	3

Course Objectives

- To Understand Knowledge on different stages of child development
- To acquire knowledge on growth and cognitive assessment
- To gain knowledge on theories of child development

Pre – requisites

- Basic knowledge on human development
- Fundamentals of human physiology

Course Outcome and Cognitive Level Mapping

CO Number	CO statement On the successful completion of the course, students will be able to:	Cognitive Level
CO 1	Label the stages and growth of child development	K1
CO 2	Describe the theories of child development	K2
CO 3	Apply assessment and techniques in child growth and cognitive	K3
CO 4	Analyze the nutritional programmes associated with adolescence	K4
CO5	Evaluate cognitive language, social and emotional development of child	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	-	3	3	-	3	3
CO2	3	3	2	2	-	3	3	-	3	3
CO3	3	3	2	2	-	3	3	-	3	3
CO4	3	3	2	2	-	3	3	-	3	3
CO5	3	3	2	2	-	3	3	-	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Growth and development of the child Meaning, concepts and principles of growth and development. Classification of developmental stages. Impact of nature and nurture on child development. Factors Influencing development of children.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Infancy, Toddler and Childhood Newborn reflexes, Infant states and hazards, Infant's sensory and perceptual capacities, Infant and toddler temperament, Sensitive and critical periods in development, Cognitive and language development. Childhood - Physical and Motor development, Cognitive and Language development.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Adolescence Physiological and Psychological changes during Adolescence, Cognitive Development; Identity formation and Identity crisis, Self-regulation and Positive youth development, Factors influencing academic achievement, Career choice, Government Programmes for Adolescents in India.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Theories of child development Meaning and importance of theories, Theories in perspectives. Psycho-social stages (Erikson), Cognitive development (Piaget), Moral development (Kohlberg), Socio-cultural approach to cognitive development (Vygotsky), Ecological systems theory (Bronfenbrenner).	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	<p>Methods of Studying Children, Assessment of Growth in children and Cognitive Abilities</p> <p>Systematic Observation, Interview, Questionnaire, Case study, Ethnography, Social survey, Clinical Method. Assessment of Growth in children - Anthropometric measurements – Height, Weight, Mid upper arm circumference, Head circumference. Assessment of Cognitive Abilities - Binet-Kamath Intelligence Test, Weschler intelligence scales for children, Raven Progressive Matrices.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Difference between growth and development,</p> <p>Psychological needs and behavioral problems of special children,</p> <p>Peer influences in adolescence,</p> <p>Impact of theories on early childhood education,</p> <p>Case study -Anthropometric assessment of children.</p>	-	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5

Text Books

1. Laura E. Berk (2005). *Child Development* (6th ed). Prentice Hall of India Private limited. New Delhi.
2. Rajammaal P. Devadas, N. Jaya. (1984). *Textbook on Child Development*. Macmillan Publisher India limited.

Reference Books

1. Santrock, J.W (2010). *Child Development: An Introduction* (12th ed). New York; McGraw Hill
2. Shaffer, D.R and Kipp, K (2007). *Developmental Psychology: Childhood and Adolescence* (7th ed).
3. Berk, L.E. (2014). *Child Development*. (7th ed). PHI learning Ltd. New Delhi
4. Shaffer, D.R, and Kipp, K. (2007). *Developmental Psychology: Childhood and Adolescence* (7th ed). Australia: Thomson Wadsworth.
5. L. Kathleen Mahan, Sylvia Escort – stump. (2008). *Krause's Food and Nutrition Therapy* (12th ed). Elsevier.

Weblinks

- <https://www.cdc.gov/ncbddd/childdevelopment/facts.html>
- <http://www.psychologytoday.com/us/basics/child-development>
- http://en.m.wikipedia.org/wiki/Developmental_stages_theories

Journals

1. National library of medicine, PubMed, Medline, USA
2. International journal of sciences and research, open access, India.
3. Journal of early childhood, SAGE journal, United States.

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment

Course Designers

- Ms. E. AGALYA
- Ms. R. ARTHY

SEMESTER III	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22PFS3GEC1	FUNDAMENTALS OF NUTRITION	GENERIC ELECTIVE	3	2

Course Objectives

- To obtain knowledge on nutrients and its classification
- To enable sources, excess and deficiency effects of nutrients
- To study the role of nutrients on human health

Pre-Requisites

- Basic knowledge on nutrients
- Fundamentals of health and its components

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Identify the interrelationship between nutrition and health	K1
CO 2	Describe basic five food groups, balanced diet, factors affecting RDA and BMR	K2
CO 3	Predict the role of nutrients in human nutrition	K3
CO 4	Determine the excess and deficiency effects of nutrients	K4
CO 5	Assess knowledge on functions of water, distribution of water and regulation of water balance and acid base and electrolyte balance	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	3	-	3	3
CO2	3	3	2	3	2	3	3	-	3	3
CO3	3	3	2	3	2	3	3	-	3	3
CO4	3	3	2	3	2	3	3	-	3	3
CO5	3	3	2	3	2	3	3	-	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>a) Introduction to Nutrition Definition of Nutrition and Health. Interrelationship between nutrition and health, adequate/ optimum nutrition and Malnutrition.</p> <p>b) Nutrients and RDA Classification and basic functions of nutrients. Basic five food group, My plate and concept of balanced diet, RDA, Factors affecting RDA.</p>	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	<p>a) Carbohydrates Nutritional classification, functions, sources, deficiency and excess effects. Dietary Fibre – classification, sources, physiological role in human nutrition</p> <p>b) Energy Units of measurement, Total Energy Requirement, Basal Metabolic Rate, Factors affecting Basal Metabolic Rate, Energy content of foods.</p>	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	<p>a) Protein Nutritional classification, functions, sources and requirements. Essential amino acids, their importance.</p> <p>b) Fat/ Lipids Classification of Fatty acids. Functions, sources and requirement of lipids. Importance of essential fatty acids, their requirement and effect of deficiency.</p>	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	<p>a) Vitamins Fat soluble vitamins -A, D, E and K- functions, sources, requirements, deficiency disorders. Water soluble vitamins - B-complex vitamins – Thiamine, Riboflavin, Niacin, Folic acid, Biotin, Pantothenic acid, B12 and Vitamin C - functions, sources, requirements and deficiency disorders.</p> <p>b) Water Functions of water in human body, water distribution, maintenance of water and regulation of acid-base balance in the body.</p>	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	<p>a)Minerals- Macro minerals Calcium, Phosphorus, Sodium, Potassium - functions, sources, requirements, deficiency and toxicity.</p> <p>b) Micro minerals Iron, Fluorine, Zinc, Copper, Iodine -functions, requirements, deficiency and toxicity.</p>	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Functions of food, Energy balance, PEM-Types, Effect of dehydration on human body, Synergetic mechanism of nutrients.	-	CO 1, CO2, CO 3, CO 4, CO 5	K1, K2, K3, K4, K5
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Text Books

1. Mudambi, SR and Rajagopal, MV. (2012). *Fundamentals of Foods, Nutrition and Diet Therapy*. (5th ed). New Age International Publishers.
2. Srilakshmi B. (2022). *Nutrition Science*. (7th ed). New Age International (P) Ltd.
3. Potter NN, Hotchkiss JH. (2006). *Food Science*. (5th ed). CBS Publishers and Distributors.
4. Sharma S, Wadhwa A. (2013). *Nutrition in the community- A textbook*. Elite Publishing House Pvt. Ltd.
5. Sunetra Roday. (2017). *Food Science and Nutrition*. (2nd ed). Oxford University Press.
6. Dr M Swaminathan. (2012). *Handbook of Food and Nutrition*. Bangalore Press.

Reference Books

1. Agarwal and Udipti. *Textbook of human nutrition*. (2014). Jaypee brothers medical publishers ltd. New Delhi.
2. Shubhangini Joshi A. (2014). *Nutrition and Dietetics*. MC Graw Hill Education (India) (P) Ltd, New Delhi.
3. Indrani T.K (2008). *Nursing Manual of Nutrition and Therapeutic Diet*. Jaypee Brothers. Medical publishers (p) Ltd, New Delhi.
4. Meera Vahisht. (2002). *Introduction to Food, Nutrition and Food Processing*. (2nd ed). Anmol Publications.

Weblinks

- <https://vikaspedia.in/health/nutrition/nutrition-and-health-1>
- <https://www.hsph.harvard.edu/nutritionsource/vitamins/>
- <https://www.ataglanceseries.com/nutrition/definition.asp>
- <https://vikaspedia.in/health/nutrition/types-of-vitamins-and-minerals>

Journals

1. Annals Food Science and Technology, Valahia University Press, Romania.
2. International Journal of Food and Nutrition Science, Wiley-Blackwell Publishing Ltd, Oxford.

Pedagogy

Chalk and Talk, E-content, Power Point Presentation, Quiz, Seminar, Assignment.

Course Designers

- Ms. B. THANUJA
- Ms. C. NIVETHA

SEMESTER IV	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS4CC8	QUANTITY FOOD PRODUCTION AND SERVICE	CORE	6	5

Course Objectives

- To gain knowledge on types of menus and menu planning.
- To learn the process of production cycle activities.
- To understand the importance of hygiene and sanitation.

Pre requisites

- Basic knowledge on food service management.
- Fundamentals of food production

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define menu planning, standardization, purchase, inventory, storage and food service.	K1
CO2	Illustrate menu, styles of food service, food service systems and kitchen organization.	K2
CO3	Compute the principles of purchasing, receiving, storage and techniques in pre-preparations.	K3
CO4	Infer standardization of recipes, portioning, production, work simplification and sanitation.	K4
CO5	Assess the techniques in food storage, management of food production, réchauffé, fuel, and maintenance of equipments.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	2	3	3
CO2	3	3	3	2	3	3	3	2	3	3
CO3	3	3	3	2	3	3	3	2	3	3
CO4	3	3	3	2	3	3	3	2	3	3
CO5	3	3	3	2	3	3	3	2	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Menu planning, standardization of recipes and Production a) Menu planning - definition, types of menu, techniques of writing a menu, menu display, study of menus for different types of quantity food outlets, courses of menu – french classical menu, uses of menu cards, important cookery terms used in menus, common terms in french and english menu, role of computers in menu planning. b) Standardization of recipe and portioning- methods and benefits. left over utilization of foods. c) Production- volume feeding- institutional and industrial catering, off premises catering, other catering establishments.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
II	Purchase, Receiving and Storage a) Indenting, Methods of buying (Informal, formal, bid, negotiation, future contracts), purchasing procedures, standard purchase specifications, methods of purchasing (contract purchasing, purchasing through quotations, cash purchases, purchasing through tenders, centralized purchases, periodical purchases), receiving of purchased items. b) Receiving- Delivery types, delivery procedures and receiving procedure. c) Storage – Perishable, Non-perishable, principles of storage (FIFO, LIFO, Bin cards), recommended temperatures for storage and inventory control.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
III	Food Service system and Styles of service a) Food service systems-Types- Conventional, Commissary, Ready prepared (cook-chill, cook- freeze) and Assembly service system. b) Styles of services (English Service, American Service, French Service, Gueridon Service, Russian Service). Types of services (Waiter service, Banquet service, Buffet service, Self- service), rules for laying a table, rules for waiting at a table.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
IV	Kitchen organization, Fuel, Work Simplification and Equipment a) Kitchen Organization - kitchen layout – Island layout, zonal layout, assembly layout. Points to be considered while designing kitchen layout. b) Fuel- Types of fuels, management and effective utilization of fuel. c) Work Simplification –Aspects and classification of work simplification. Mise-en –scene, Mise- en-place.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5

	d)Equipment – Classification, Traditional Vs Modern equipment. Equipment required for quantity food production – major and minor with reference to receiving, storage, preparation, service, dish washing and garbage disposal area. Use, care and maintenance of equipment.			
V	Safety, Hygiene and Sanitation a)Safety- Causes of accidents in food industry, Three Es of safety, Safety procedures, First aid, Fire accident - types, prevention and control, pest control, Work environment safety, safety management programmes. b)Hygiene and Sanitation – Environmental hygiene and sanitation, hygiene in food handling, personnel hygiene.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Preliminary techniques in food production. Advantages of purchases in food industry. Equipment in service area - (silver, crockery, glassware, stainless steel, plastics and melamine ware). Ways to improve fuel consumption in kitchen. Effective sanitation approaches in food industry.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Negi J. (2014). *Professional Hotel Management*. S. Chand and Company Limited, New Delhi.
2. Palacio JP. Harger V. Shugari G. (2001). *West and Woods Introduction to Food Service*. Mac Millan Pub Co., New York.
3. Krishna Arora (2008). *Theory of cookery*. Fronk Bros and co. Publishers, New Delhi
4. Vijay Dhawan (2018). *Food & Beverage Service*. Frank Bros & co, New Delhi.
5. Singaravelavan R.(2018). *Food & Beverage Service*. Oxford University press. New Delhi.
6. Cessarani V. Kinton R., (2004). *Practical Cookery*. 10th ed. Hodder and Stoughton publishers.
7. Thangam Philip (2005). *Modern Cookery*. 3rd ed. Orient Longmam Limited.
8. Sethi M. and Malhan S.M. (20018). *Catering Management- An Integrated Approach*. 3rd ed. Wiley Eastern Limited, Mumbai.

Reference Books

1. Khan MA.(2003). *Food Service Operations*.AVI Publications Co., Connecticut.
2. Tharun Bansal (2015). *Hotel Facility Planning*, Oxford University Press
3. Pearson. (2016) *Principles and Practices*. 13th ed. Pub. Harlow:.
4. John B. Knight, Lendal H. Kotschevar. (2017) 3rd ed. *Quantity: food Production, Planning and Management*, John Wiley and Sons,.
5. Parvinder S Bali.(2012). *International Cuisine and Food Production Management*. Oxford. New Delhi.

Web links

- <https://blog.cvent.com/events/food-service-styles/>
- <https://www.nidirect.gov.uk/articles/storing-food-safely>
- <http://www.breakingtravelnews.com/focus/article/different-types-of-cuisines-around-the-world-come-with-us-and-enjoy-the-exp/>
- <https://opentextbc.ca/foodsafety/chapter/storage-temperatures-and-procedures/>
http://www.searo.who.int/entity/world_health_day/2015/whd-what-you-should-know/en/

Journals

1. Journal of Foodservice Business Research, Haworth Press Inc. publishing, United States
2. Food Hygiene and Safety Science, Food Hygiene & Safety publishing, Japan.
3. Food, Culture & Society, Association for The Study of Food and Society publishing, United States.
4. Manufacturing and Service Operations Management, Institute for Operations Research and The Management Sciences publisher, United States.

Pedagogy: Lecture, Seminar, Assignment, Power point presentation, Industrial visits.

Course Designers

- Ms. E. AGALYA
- Ms. T. R. REVATHI

SEMESTER IV	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS4CCC3A	MANAGEMENT AND ACCOUNTING IN HOSPITALITY INDUSTRY	CORE CHOICE	6	4

Course Objectives

- To understand the forms and practices adopted in hospitality industry
- To gain knowledge on the various sources of finance.
- To learn various marketing procedures.

Pre requisites

- Basic principles of management
- Fundamentals of accounting

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define the management and importance of hospitality management	K1
CO2.	Explain the scope of hospitality industry	K2
CO3.	Apply the basic strategies involved in marketing	K3
CO4.	Analyse financial statements by using basic accounting techniques	K4
CO5.	Assess the types of various records used in front office area	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	2	3	2	3	2
CO2	3	3	3	2	3	2	3	2	3	2
CO3	3	3	3	2	3	2	3	2	3	2
CO4	3	3	3	2	3	2	3	2	3	2
CO5	3	3	3	2	3	2	3	2	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Management Accounting Definition, need and importance of management accounting, cost accounting, difference between management accounting and cost accounting, working capital management, importance of working capital management, Total Quality Management in hospitality industry.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
II	Hospitality marketing and marketing communication Definition of sales and marketing, marketing activities, relationship between sales and marketing, elements of marketing, role of sales department. Marketing communication, media analysis, public relations, press releases, market research and planning, supply and demand.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
III	Basic Accounting Sources of Finance- classification, need for accounting, cash flow analysis, book-keeping and accounting, single entry book keeping system, double- entry system, journal- sub divisions of journal, ledger, trial balance, balance sheet, cashbook –profit and loss account, accrual accounting, cash basis accounting, depreciation and amortization, profitability ratios, liquidity ratios, leverage ratios, budgetary control.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
IV	Front office accounting and Automation in Hospitality Industry Guest accounting, non guest accounting, main function of accounts and its system, types of folios and accounts maintained by the front office cashier,	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5

	front office accounting cycle, types of postings, methods of handling guest accounts, methods of account settlements. Automation in Hospitality Industry-Advantages of using computers in food service institutions, Record keeping systems. Point of sale (POS) and Property Management Systems (PMS).			
V	Food and Beverage Cost control Food and Beverage cost, cost analysis, cost control methods, market reports, inventory control, food and beverage cost reconciliation – ingredient control, preparation control, beverage control techniques, waste reduction and sustainability	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Types of costs. Activities of marketing and sales team in hospitality industry. Petty cash book. Benefits of property management system. Pillars of sustainability in hospitality industry.	-	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5

Text Books

1. L.Dennis Foster. (1993). *Food and Beverage: Methods and Cost controls*. McGraw – Hill International Editions, United States
2. Paul R. Dittmer. (2002). *Dimensions of the hospitality industry*. John Wiley and Sons Inc.

Reference Books

1. A.Murthy and S. Gurusamy.(2008). *Essentials of Management Accounting*. McGraw – Hill International Editions, United States
2. RajniSofat and PreetiHird. (2008). *Basic Accounting*. Prentice Hall of India Pvt.Ltd.
3. S.K.Bhatnagar. (2005). *Front Office Management*. Frank Bros and Co.

Web links

- <https://www.investopedia.com>
- https://link.springer.com/chapter/10.1057/9780230353275_19
- <https://www.toppr.com/guides/business-environment/business-functions/financial-management>

Journals

1. Journal of Management Accounting Research, Chapel Hill, USA
2. Journal of Accounting Research, Accounting Research Centre, University of Chicago

Pedagogy:

Lecture, Power point presentation, Seminar, Assignment.

Course Designers

- Ms.M.VINOTHINI
- Ms.C.NIVETHA

SEMESTER - IV	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS4CCC3B	TECHNIQUES IN FOOD ANALYSIS	CORE CHOICE	6	4

Course Objectives

- To understand the types of instruments available for food analysis.
- To acquire knowledge on the methods used for food analysis.
- To understand the functioning of instruments.

Pre requisites

- Basic skills on the quantification technique of various components.
- Principle and instrumentation used in food quality analysis.

Course Outcome and Cognitive Level Mapping

CO Number	CO statement	Cognitive level
	On the successful completion of the course, students will be able to:	
CO 1	Identify the knowledge obtained to choose the appropriate instrument and technique for food analysis	K1
CO 2	Explain the role of chromatography and spectrometry in food analysis	K2
CO 3	Predict the importance of advanced chromatography and electrophoresis techniques	K3
CO 4	Infer the usage of various analytical techniques for quality of food analysis.	K4
CO 5	Evaluate the methods and types of radioactive isotopes and their functions.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	1	3	2	2	2	-
CO2	3	2	3	2	1	3	2	2	2	-
CO3	3	2	3	2	1	3	2	2	2	-
CO4	3	2	3	2	1	3	2	2	2	-
CO5	3	2	3	2	1	3	2	2	2	-

“1” – Slight (Low) Correlation → “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation → “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to food analysis: Objectives, need, laboratory rules, criteria for selection techniques of food analysis, Basic Instrumentation – principles, importance and application of pH meter, Dialysis, ultra filtration, Reverse osmosis, Centrifugation, chromatography, calorimetry, moisture analyser, particle size analyser, dryers, Densimetry, Texture profile analysis.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
II	Chromatographic Technique: Components, Principle, Schematic diagram, applications of paper, thin layer, partition chromatography, Advance Chromatography-Gas chromatography, High Performance Liquid Chromatography (HPLC), Thin Layer Chromatography (TLC), High Performance Thin Layer Chromatography (HPTLC). Electrophoresis: Paper & gel electrophoresis, PAGE, iso-electric, 2D electrophoresis, Immuno electrophoresis.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
III	Spectroscopic Technique – Components, Principle, Schematic diagram, applications of UV-Visible Spectroscopy, Atomic-Absorption Spectroscopy (AAS), Nuclear Magnetic Resonance Spectroscopy (NMR), Fourier Transform Infrared Spectroscopy (FTIR), Mass spectrometry.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
IV	Advance Method of Analysis Components, Principle, Schematic diagram, applications of Nuclear magnetic resonance (NMR) spectroscopy, Enzyme-linked immunosorbent assay (ELISA) LFD (lateral flow device) , Differential Thermal Analysis (DTA) ,Differential Scanning Calorimetry (DSC) , Radioactive isotopes, X- Ray Diffraction (XRD)	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5

V	Application in Quantitative Food Analysis – Carbohydrates – Phenol Sulfuric acid method, Protein – Kjeldhal Nitrogen method, Fat - Soxhlet, Vitamins – analysis of fat soluble vitamins by UHPLC using UV detection, Minerals, Sugars, Food Additives- Determination of Fat in Cereals and Cereal-based Products by Randall Extraction- Method and Toxic Substances	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Principles of Hot air oven, Types of Liquid Chromatography, Importance of UV-Visible Spectroscopy Types of Radioactive isotopes Application in Quantitative Food Analysis -fat soluble vitamins	-	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5

Text Books

1. Semih Otles. (2016). *Handbook of Food Analysis Instruments*. CRC Press, Bangalore
2. Suzanne Nielsen. (2014). 4th ed. *Food Analysis*. Springer Science & Business Media.
3. Kaur. N. (2021). 3rd ed. *Instrumental methods of chemical analysis*. Pragati Prakashan Educational Publishing. Garhwal
3. S.M Knopkar. (2013) *Basic concepts of Analytical Chemistry*. New Age International (P) Ltd., Publishers. New Delhi.

Reference Books

1. Dr R.S. Khandpur. (2007) 2nd ed. *Handbook of Analytical Instruments*. Tata McGraw-Hill Education.
2. Semih Otles, (2011). 2nd ed. *Methods of Analysis of Food Components and Additives*. CRC Press, Bangalore.

Web links

- <https://egyankosh.ac.in/bitstream/123456789/12395/1/Unit-13.pdf>
- <https://www.omicsonline.org/scholarly/food-analytical-chemistry-journals-articles-ppts-list.php>

Journals

1. Journal of Food Composition and Analysis, Elsevier, University of Reading, Reading, UK.
2. Journal of Food Science and Technology, Association of Food Scientists and Technologists of India, Mysuru, Karnataka.

Pedagogy

Lecture, Assignment, PowerPoint presentation, Quiz, Seminar, E-content, Industrial Visit.

Course designers

- Ms.T.R. REVATHI
- Ms.N.GANGA DEVI

SEMESTER IV	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS4CCC3C	DIETARY COMPLIANCE AND COUNSELLING SKILLS	CORE CHOICE	6	4

Course Objectives

- To acquire knowledge on basic etiquette of a counsellor.
- To handle different areas of counselling.
- To gain knowledge on counselling process.

Pre requisites

- Fundamental knowledge on dietary principles.
- Basic knowledge in growth and developmental stages of life cycle.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Identify the psychology and nutritional status of client	K1
CO2.	Explain communication skills for various groups	K2
CO3.	Apply counselling techniques as per the needs of various groups	K3
CO4.	Determine the sources of counselling data	K4
CO5.	Evaluate the impact of counselling	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	2	3	2	3	2
CO2	3	3	3	2	3	2	3	2	3	2
CO3	3	3	3	2	3	2	3	2	3	2
CO4	3	3	3	2	3	2	3	2	3	2
CO5	3	3	3	2	3	2	3	2	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Basics in Counselling Definition, Goals, Ethics, Scope, Characteristics of counsellor, types of counselling, objectives of counselling in health care, tools of counselling, sources of counselling, e - resources in counselling. Role of a Dietician -Role of a dietician in a hospital and community, team approach to nutritional care, ethical code and responsibility. Defining features of counselling psychology.	18	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5
II	Communication for counselling: Concepts and principles in communication and their application in developing skills in counseling. Use of communication aids, communication and interviewing skills. Strategies and communication skills, Rapport building and opening techniques, Questioning, listening, reflecting, acceptance, silence, leading reassurance, non-verbal behavior, terminating skills.	18	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5
III	Process of Counselling Techniques for obtaining relevant information, Clinical Information, Medical History and General Profile, Dietary Diagnosis -Assessing food and nutrient intakes, Lifestyles, physical activity, stress, Nutritional Status, correlating relevant information and identifying areas of need: Problem exploration and clarification, Developing new perspectives and setting goals, implementation, follow up and evaluation.	18	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5
IV	Working with different groups Hospitalized patients (adults, pediatric, elderly, special needs,), adjusting and adapting to individual needs. Outpatients (adults, pediatric, elderly and special needs), techniques and modes.	18	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5
V	Various Therapeutic Techniques Psychoanalytic therapy, group therapy, psychodrama, behavior therapy, Cognitive therapy. Nutrition counselling protocols- Involving phase, Exploration and education, resolving, closing. Exploring the expressions, use of art in therapy.	18	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Psychological assessment and testing procedure. Non-verbal communication aid. Social support agencies. Care takers education Gestalt therapy	-	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5

Text books

1. Sujata Sriram. (2016). *Counselling in India Reflection on the process*. Springer, Singapore.
2. Susan Davison. etal. (2013). *Clinical Counselling in Medical Settings*. Taylor and Francis, London.
3. Shubhangini A. Joshi. (2011). *Nutrition and Dietetics*, 3rd edition, Tata McGraw Hill Education private limited, New Delhi.
4. Srilakshmi B. (2010). *Dietetics*, New Age International Publishers, New Delhi.

Reference books

1. Kathleen D. etal. (2016). *Nutrition Counseling and Education Skill Development*. Cengage Learning, United States of America.
2. Judy Gable. Tamara Herrmann. (2016). *Counselling Skills for Dietitians*. 3rd ed Blackwell Publishing, Singapore.

Web links

- <https://learn.microsoft.com/en-us/microsoft-365/community/principles-of-communication>
- <https://www.mhinnovation.net/PMHP-Basic-Counselling-Skills.pdf>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6351246/>

Journals

1. Journal of Counselling Psychology, American Psychological Association, America.
2. British Journal of Guidance and Counselling, Taylor and Francis, United Kingdom
3. British Journal of Occupational Therapy, Sage Publication, United States.
4. Counselling and Psychotherapy research, Wiley online Library, United Kingdom.

Pedagogy:

E-content, Lecture, Power point presentation, Seminar, Assignment.

Course Designers

- Ms.S.FATHIMA
- Ms.E.AGALYA

SEMESTER IV	INTERNAL MARKS: 40		EXTERNAL MARKS:60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS4CC4P	QUANTITY FOOD PRODUCTION AND SERVICE (P)	CORE PRACTICAL	6	5

Course Objectives

- To gain knowledge in menu planning and product standards to maintain quality.
- To learn aspects on quantity production and quality control.
- To understand the importance of styles of services and courses of menu.

Pre requisites

- Principles of menu planning .
- Basic skills in food production.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Identify the menu, table setting and napkin folding and production area.	K1
CO 2	Explain standardization of recipes, portion control and napkin folding.	K2
CO 3	Illustrate the courses of menu, napkin folding and layout.	K3
CO 4	Infer the role of ingredients in various regional cuisines	K4
CO 5	Evaluate different cuisines and techniques in layout for different production area.	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	2	3	3
CO2	3	3	3	2	3	3	3	2	3	3
CO3	3	3	3	2	3	3	3	2	3	3
CO4	3	3	3	2	3	3	3	2	3	3
CO5	3	3	3	2	3	3	3	2	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

List of Experiments

1. Standardization of recipes, Portion control and Pricing.
2. Table Setting and Napkin folding.
3. Planning and Preparation sauce, soup and salad.
4. Planning and Preparation of Continental cuisines.
5. Planning and Preparation of Western cuisine
6. Planning and Preparation of South Indian cuisine
7. Planning and Preparation of North Indian cuisine
8. Planning and Preparation of Chinese cuisine
9. Planning and Preparation of Thai cuisine.
10. Plan and design a layout for small, medium and large production area.

Text Books

1. Negi J. (2014). *Professional Hotel Management*. S. Chand and Company Limited, New Delhi.
2. Palacio JP. Harger V. Shugari G. (2001). *West and Woods Introduction to Food Service*. Mac Millan Pub Co., New York.
3. Krishna Arora (2008). *Theory of cookery*. Fronk Bros and co. Publishers, New Delhi
4. Vijay Dhawan (2018). *Food & Beverage Service*. Frank Bros & co, New Delhi.
5. Singaravelavan R.(2018). *Food & Beverage Service*. Oxford University press. New Delhi.
6. Cessarani V. Kinton R., (2004). *Practical Cookery*. 10th ed. Hodder and Stoughton publishers.
7. Thangam Philip (2005). *Modern Cookery*. 3rd ed. Orient Longmam Limited.
8. Sethi M. and Malhan S.M. (20018). *Catering Management- An Integrated Approach*. 3rd ed. Wiley Eastern Limited, Mumbai.

Reference Books

1. Khan MA.(2003). *Food Service Operations*.AVI Publications Co., Connecticut.
2. Tharun Bansal (2015). *Hotel Facility Planning*, Oxford University Press
3. Pearson. (2016) *Principles and Practices*. 13th ed. Pub. Harlow:.
4. John B. Knight, Lendal H. Kotschevar. (2017) 3rd ed. *Quantity: food Production, Planning and Management*, John Wiley and Sons,.
5. Parvinder S Bali.(2012). *International Cuisine and Food Production Management*. Oxford. New Delhi.

Pedagogy:

Lecture, Demonstration, Practical, ICT tools, Industrial visits.

Course Designers

Ms. T.R. REVATHI

Ms. E. AGALYA

SEMESTER IV	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS4GEC2	COMMUNITY NUTRITION	GENERIC ELECTIVE	3	2

Course Objectives

- To provide information regarding nutritional assessment
- To enable students to impart nutrition education among rural and needy people.
- To acquaint them knowledge regarding national and international program running in the field of community nutrition

Pre-requisites

- Fundamentals of community nutrition.
- Basic knowledge on nutrition intervention programmes.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On Successful Completion of the course, students will be able to	
CO1	State the interrelationship between health and nutrition and list role of community nutritionist in public health care system.	K1
CO2	Illustrate the assessment methods of nutritional status and nutrition education.	K2
CO3	Apply the significance of nutritional care for different age groups in community.	K3
CO4	Determine prevalence, causes, consequences and prevention of common nutritional problems in India.	K4
CO5	Assess the role of nutrition education for the community.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	1	1	2	-	2	1	-	1	1
CO2	2	1	1	2	-	2	1	-	1	1
CO3	2	1	1	2	-	2	1	-	1	1
CO4	2	1	1	2	-	2	1	-	1	1
CO5	2	1	1	2	-	2	1	-	1	1

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Nutrition and health Relationship between health and nutrition, Malnutrition-Definition, Causes, Consequences, Poverty -disease cycle, role of community nutritionist in public health care system	9	CO1, CO2, CO3, CO4, CO5.	K1,K2,K3,K4,K5
II	Nutritional problem in India Prevalence, causes, consequences and prevention of common nutritional problems in India: Protein Energy Malnutrition (PEM), Severe Acute Malnutrition (SAM), Anemia, Vitamin A deficiency disorder, Iodine deficiency disorder, Fluorosis.	9	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
III	Assessment of nutritional status Anthropometry Assessment, Biochemical Assessment, Clinical Examination and Dietary Assessment	9	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
IV	Nutritional Care for different age groups in Community – Pregnancy, lactation, infants, pre-school, school going, adult and old age	9	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
V	Nutrition education Definition, Need and Scope, Importance and Process of Nutrition education, Methods used in Nutrition education- Individual, Group, Mass Approach, Nutrition education aids/tools, Role of computer and computer applications in Nutrition education.	9	CO1, CO2, CO3, CO4, CO5.	K1,K2,K3,K4,K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Comparison of Under nutrition and over nutrition , Symptoms of Anaemia, Dietary assessment -Food weightment method, Role of nutrition intervention programmes, Application of education modules in nutrition intervention	-	CO1, CO2, CO3, CO4, CO5.	K1,K2,K3,K4,K5

Text Books

1. Srilakshmi B, Suganthi V. (2023). *Community Nutrition*. New age International (P) Ltd., Publishers, New Delhi.
2. Bamji .M.S, Prahlad Rao.N, Reddy V (2016). *Textbook of Human Nutrition*. Oxford and PBH Publishing Co. Pvt. Ltd, New Delhi.
3. Park K (2011). *Park's Textbook of Preventive and Social Medicine*, 21st Edition. M/s Banarasidas Bhanot Publishers. Jabalpur. India
4. Wadhwa A and Sharma S (2003). *Nutrition in the Community- A textbook*. Elite Publishing House Pvt. Ltd. New Delhi.
5. Swaminathan. M. (2014). *Advanced Textbook of Food and Nutrition*. The Bangalore Printing and Publishing Co. Ltd. Bangalore.

Reference Books

1. Suryatapa Das. (2023). *Textbook of community Nutrition*, Academic Publishers, Kolkata.
2. M. Margaret Barth Ronny A Bell Karen Grimmer (2021). *Public Health Nutrition, Rural Urban and Global based practice*. Springer Publishing Company, UK

Web links

- <https://egyankosh.ac.in/bitstream/123456789/33444/1/Unit-15.pdf>
- <https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=318&printable=1>
- <https://egyankosh.ac.in/bitstream/123456789/75045/3/Unit-7.pdf>
- <https://www.fao.org/3/i9940en/I9940EN.pdf>

Journals

1. International Journal of Public Health and Nutrition, Cambridge University press, UK.
2. Indian Journal of Health and Wellbeing, Indian Association of Health, Research and Welfare, Hisar, Haryana.

Pedagogy

Lecture, Assignment, PowerPoint presentation, quiz, seminar, E-Content.

Course Designers

Dr..B.THANUJA

Ms. N.GANGA DEVI

SEMESTER IV	INTERNAL MARKS: -		EXTERNAL MARKS:100	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
23PFS4PW	PROJECT WORK	PROJECT	9	4

Course Objectives

- To Design the framework to collect data.
- To develop the ability to solve a specific research problem.
- To understand the importance of experimental analysis.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Define the research design	K1
CO 2	Describe research problem	K2
CO 3	Classify collected data	K3
CO 4	Examine collected data and associate with statistical tools	K4
CO 5	Assess publish papers in reputed research journals	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	1	1	2	3	2	3	1
CO2	3	3	3	1	1	2	3	2	3	1
CO3	3	3	3	1	1	2	3	2	3	1
CO4	3	3	3	1	1	2	3	2	3	1
CO5	3	3	3	1	1	2	3	2	3	1

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no correlation.

COMPONENTS OF PROJECT REPORT

- Introduction and objectives
- Purpose
- Review of Literature
- Methodology
- Results and Discussion
- Summary and Conclusion
- Bibliography

Course Designer

- Dr. B.THANUJA

EVALUATION PATTERN

S.No.	Components	Marks
1.	Introduction	15
2.	Review of Literature	15
3.	Methodology	15
4.	Results and Discussion	15
5.	Summary and Conclusion	10
6.	Bibliography	10
7.	Viva	20
	TOTAL	100