CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED (IIICYCLE) 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**

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 breath 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 On Successful Completion of the course, students will be able to	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** a) 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. b) Classification based on market segment/ Food service style c) Commercial and non commercial food services. d) 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. e) Catering transport services – Air, railway, cruise ships, space missions. f) Catering in hospital and educational institutions. g) Industrial catering and community feeding (Places of worship), Social catering (weddings, functions). h) Franchise, chain, contract and outdoor catering services. i) 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** a) Organization – Definition and types. b) Approaches to management – classical, neo classical, systems approach, behavioral and human relations approach, contingency approach, JIT (Just in time) approach. c) 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** a) Classification of equipment – equipment for food storage, pre-preparation, cooking, holding, serving, dishwashing and auxiliary equipment. b) Equipment design, construction and finishes. c) Factors influencing selection of equipment; Trends in equipment available in the market. d) 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** a) **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

	b) **Hygiene of plant and equipment** Principles of cleaning and sanitation. Dishwashing – types and uses. c) **Food hygiene** • 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	**Safety and Sustainability** a) **Safety in Food Service Units –** causes and prevention of accidents, 3Es of safety and action for emergencies. b) **Sustainable practices and green initiatives** i. Conservation of natural resources – water and energy conservation. ii. Green design and energy saving in electrical equipment. iii. Integrated solid waste management – sources, reduction, reuse/up cycle and recycle; facility waste assessment; pest control.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	**SELF STUDY FOR ENRICHMENT** **(Not to be included for External Examination)** Difference between commercial and non commercial food services, Relate functions of management with food industries, Difference between electrical and nonelectrical equipment used in food service institution, Hygienic practices to be followed by food handlers, Methods of pest control.	-	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, HargerV.P. (2006). *Food Service in Institutions.* John Willey 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 On the successful completion of the course, students will be able to	Cognitive Level
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	**Evaluation of food quality, Food adulteration and Food additives** 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. 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. c)Food adulteration- types, adulterants, and ways to detect them. d)Food additives- role in cooking- FSSAI-regulations.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	**Cereals and Pulses** 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. 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. 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.	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.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	c) Recent concepts in Food Science- Nutraceuticals, Functional foods, sustainable alternative proteins (plant proteins, algae, and microalgae, mycoprotein), biofortification, organic food.			
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

Text Books

1. Shakuntala Manay, N. (2013). *Foods: Facts and Principles*. (3rded.). New Age InternationalPublishers, New Delhi.
2. Swaminathan. M. (2019). *Advanced Text Book on Food and Nutrition*. (2nded.). BangalorePrinting 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 Publishersand 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).*Biochemicalmethodsforagriculturalsciences*.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,MiriahPace (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 BrasileiraCienciaTechnologia 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 On the successful completion of the course, students will be able to	Cognitive Level
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; Erythropoesis; 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 lungsin the exchange of gases. Transport of oxygen and Co2. 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. Murugesh.N.(2010).*AnatomyPhysiologyandHealthEducation*.(6thed.).

ReferenceBooks

1. Guyton (2000). Guyton and Hal *Textbook of Medical Physiology*. Saunders.UnitedStates ofAmerica.
2. WaughAnneRossandWilson(2003).*AnatomyandPhysiologyinHealthand Illness.* Churchill Livingston. New York.
3. Murugesh.N(2011).*AnatomyandPhysiology*. SathyaPublishers. Madurai.
4. Wilson,Ross(2014).*AnatomyandPhysiologyinHealthandIllness.* ReedElsevierIndiaPrivate Limited. NewDelhi.

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,Powerpointpresentation,Seminar,Assignment,Practical.

CourseDesigners

- Ms. ARTHY . R

SEMESTER I	INTERNAL MARKS:40			EXTERNAL MARKS:60
COURSE CODE	COURSETITLE	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 On the successful completion of the course, students will be able to	Cognitive Level
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. ShakuntalaManay, N. (2013). *Foods: Facts and Principles*. (3rded.). New Age InternationalPublishers, New Delhi.
2. Swaminathan. M. (2019). *Advanced Text Book on Food and Nutrition*. (2nded.). BangalorePrinting 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 Publishersand 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).*Biochemicalmethodsforagriculturalsciences*.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,MiriahPace (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

SEMESTERI	INTERNALMARKS:25		EXTERNALMARKS:75	
COURSE CODE	**COURSETITLE**	**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 On the successful completion of the course, students will be able to	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	**Determination of microorganisms and their relevance in food** a) Importance and significance of microorganisms in food. Factors affecting the growth of micro-organisms in food – Intrinsic and Extrinsic parameter. b) Sampling, sample collection, transport and storage, sample preparation for analysis. Microscopic and culture dependent methods-,culture, enumeration and isolation methods. 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.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	**Spoilage and Preservation of Foods from microbial contamination** 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. b) Chemical, Modified atmosphere, Radiation of foods from the microbiological angle. c) Indicators of water and food safety and quality: Microbiological criteria of foods and their Significance. ISO systems for food safety.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	**Food borne diseases and food safety concept** a)Bacterial food borne diseases (Staphylococcal intoxification, Botulism, Salmonellosis, Shigellosis, Bacilluscereus Gastroenteritics) 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. b) Food safety concept- Importance of food safety in the food processing industry Risk classification, National and international food regulatory agencies, General food laws and food safety regulations,	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	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	**SELFSTUDYFORENRICHMENT** **(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. PelczarJr 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.pdfhttps://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, PrahladRao 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 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** a**nd 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*, (3rdedition) 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 On the successful completion of the course, students will be able to	Cognitive Level
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
"2" – Moderate (Medium) Correlation
"3" – Substantial (High) Correlation
"-" indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE
I	**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. **Nutritional problems** - PEM, Vitamin A Deficiency Diseases, Anaemia, Iodine Deficiency Disorders and Fluorosis, Synergism between malnutrition and infection.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	**Nutrition Intervention programmes in India** 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.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	**National Programs to Combat Malnutrition** 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 **National organization** 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).	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	**International Organizations** World Bank, World Health Organization (WHO) - Sustainable development goals, United Nations International Children's Emergency Fund (UNICEF), World Food Programme (WFP), Voluntary organizations –	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	Global Alliance for Improved Nutrition (GAIN), World Alliance for Breastfeeding Action (WABA)			
V	**Nutrition Assessment** 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. Indirect method - Vital Statistics – Interpretation of mortality and morbidity using biostatistics **Nutrition Education** 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.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	**SELF STUDY FOR ENRICHMENT** (Not to be included for External Examination) Classification according to grades of malnutrition. Mission of ICDS Diarrhea Control Program. Activities of World Health Organization (WHO). Problems of nutrition education programme.	-	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, PrahladRao N, Reddy. (2016)*Textbook of Human Nutrition*.(4th ed.).Oxford and PBH Publishing Co. Pvt. Ltd. New Delhi.

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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 On the successful completion of the course, students will be able to	Cognitive Level
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	**a) Dietitian** Definition and types of dietitians, role of dietitian in the hospital and community. **b) Counseling** Definition, Counsellor and Client, Classification of Counseling and techniques of counseling. **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.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	**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. **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. **c) Diet for Developmental Disabilities -** Down's syndrome, Cerebral Palsy, Autism and Attention Deficit Hyperactivity Disorder.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	**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. **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. **c) Diet for Pancreatic Disorders** Pathogenesis, etiology, types, symptoms and clinical findings and dietary modification for Pancreatitis.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

IV	**a) Diet for Obesity** Etiology, energy balance**,** clinical manifestation, complications, dietary and lifestyle modifications and surgical management. b) **Diet for Metabolic Disorders- Diabetes Mellitus** 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. **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	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	**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. **b) Drug Nutrient Interaction** Diet effects on drug disposition, Interactions of drugs and nutrients, Effect of drugs on food intake and absorption, Effect of nutrients on drug metabolism. c) **Computers in Nutrition Practice** General information – data input, data output, data analysis, data communication, clinical care – communication in patient care, Nutritional therapy.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	**SELF STUDY FOR ENRICHMENT** **(Not to be included for External Examination)** Activities of IDA -Professional ethics and obligations of dietitian. Aetiology of HIV. Types of jaundice. Theories and grades of obesity. Causes of urinary tract infection	-	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 & AlliedPvt. Ltd.

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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.

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- 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 On the successful completion of the course, students will be able to	Cognitive Level
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	**a. Biochemical Data Acquisition and Interpretation** Basis for biochemical estimation of basic principles- uses of biochemical data in clinical medicine. Acquisition and interpretation of biochemical data. **b. Detoxification Mechanism** Phase one reaction – Oxidation, Reduction, Hydrolysis, Phase two – Glucuronic acid, sulfate methylation **c. Disorders of Erythrocyte Metabolism** Hemoglobinopathies, thalassemia, thrombosis	**18**	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
II	**a. Disorders of Carbohydrate Metabolism** Glycohemoglobin, hypoglycemia, galactosemia and ketone bodies, Various types of glucose tolerance tests. Glycogen storage diseases. Inborn errors of carbohydrate metabolism. **b. Disorders of Protein Metabolism** Phenylalaninemia, homocystinuria, tyrosinemia, maple syrup urine diseases, Phenylketonuria, alkaptonuria, albinism and aminoaciduria. Disorders in purine/ pyrimidine metabolism. **c. Disorders of Fat Metabolism** Dyslipidemia, Atherosclerosis, Coronary Artery Disease, Disorders of lipoproteins and Steatorrhea.	**18**	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
III	**a. Disorders of Mineral Metabolism** 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.	**18**	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5

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

RELATED EXPEREINCE

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 wilkin.
2. DM Vasudevan, Sreekumari S, Kannan Vaidyanathan (2013). *Textbook of Biochemistry for Medical Students.(*7th ed*)* S Jaypee brother's 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 On the successful completion of the course, students will be able to	Cognitive Level
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	**Introduction to quality control** **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. **b)** Quality Council of INDIA, History, Objectives, Role of Quality Council of India, Voluntary quality standards and certification.	**18**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	**Food authority in India** **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. **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.	**18**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	**Structure and functions of Food Authority** **a)** Food safety officer and their powers, analysis of food – regulations regarding labs involved in food analysis, offences and penalties. **b)** Promoting safe and wholesome Food (Eat Right India, Food Fortification, SNF, Clean Street	**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 Udupi., (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

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- http://www.fao.org/trade/docs/LDC-foodqual_en.htm
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- 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 On the successful completion of the course, students will be able to	Cognitive Level
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 "2" – Moderate (Medium) Correlation
"3" – Substantial (High) Correlation "-" indicates there is no correlat

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	**Screening and Nutritional Assessment of Critically Ill Patients** **a. Screening:** Diagnosis of malnutrition, Nutrition screening, Methods for nutritional screening Malnutrition Universal Screening Tool, Nutritional Risk Screening, Mini Nutritional Assessment. **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.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1, K2, K3, K4, K5
II	**Nutritional Care for Hospitalized Patients** **a. Principles of nutrition care** – Nutrition care process, Progressive diets- Clear fluid diet, full fluid diet, soft diet, mechanical soft diet and regular diet. **b.Surgical Conditions**- Hormonal response during surgery, levels of stress, starvation, sepsis, Infections, pre operative diet, post operative diet.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
III	**Special Feeding Methods** **a. Enteral nutrition** – Types, routes, mode of feeding, importance and procedure, advantages and disadvantages of home-based feed, precautions while feeding and complications. **b. Parenteral nutrition** – Types, composition, procedure, importance of total parenteral nutrition, precautions while feeding and complications. Refeeding syndrome and clinical manifestations of refeeding syndrome.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
IV	**Nutritional Support for Burn and Trauma** **a. Burns** – Principles of nutrition management, mode of feeding, Clinical effects of malnutrition and factors affecting nutritional requirements in burn patients. **b. Trauma** – Classification, Principles of nutrition management, timing and route of feeding, Clinical effects of malnutrition and factors affecting nutritional requirements in trauma patients.	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
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.

SYLLABUS

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 On the successful completion of the course, students will be able to	Cognitive Level
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, aloevera, 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	**Role of Functional Foods and Nutraceuticals in Diseases :** Diabetes mellitus, Hypertension, Ulcer Osteoporosis, Cancer, Obesity and Stress. **Role of Functional Foods and Nutraceuticals in Disorder :** Hypercholesterolemia, Neurological disorders Nephrological disorders, Liver disorders.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	**Isolation and Extraction Functional Component from Plant and Animal Materials:** Extraction methods- Extraction of phenolic compounds using solvents, Microwave- assisted Extraction, Ultrasonic – assisted Extraction. Recent developments in the isolation, purification and delivery of phytochemicals. **Regulatory Aspects of Functional Foods and Nutraceuticals** Regulatory aspects- CODEX, DSHEA, FOSHU, FSSAI, AYUSH, development of biomarkers to indicate the efficacy of functional ingredients, Research frontiers in functional foods.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	**Nutrigenomics** 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. Nutrigenomics approaches to unraveling physiological effects of complex foods. **Modifying Disease Risk through Nutrigenomics**	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	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 1*. Daya Publishing House, New Delh
2. Chavan,U.D. (2017) *Nutraceutical Functional Foods– Volume I1*. Daya Publishing House, New Delh

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.nutritionsociety.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 On the successful completion of the course, students will be able to	Cognitive Level
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** **a.** Housekeeping- Objectives, qualities and etiquette of housekeeping staff. inter and intra departmental co-ordination, role of housekeeping in hospitality and food service establishment **b.** 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** 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** **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,	18	CO 1 CO 2 CO 3 CO 4 CO 5	K1, K2, K3, K4, K5

	types, characteristics, selection, par stock, Function of Tailor room. **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.			
IV	**Elements and principles of Interior Design** **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. **b.** Color –color dimensions– hue, value and intensity, color therapy and psychology. Color systems, applications of color in interior and exterior.	18	CO 1 CO 2 CO 3 CO 4 CO 5	K1, K2, K3, K4, K5
V	**Accessories in Interior Design** **a.** Accessories-meaning, types-functional, decorative. Importance of lighting, sources, types, glare- its types, causes and prevention. Styles of furniture – traditional, contemporary and modern design. Furniture for different purpose, furnishing materials. Selection, use and care of furnishing materials. **b.** Window Treatment - draperies, curtains type and uses. **c.** Flower arrangement- requirements, care of flowers, types and styles of flower arrangements.	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

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 On the successful completion of the course, students will be able to	Cognitive Level
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,	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.

	seal and shrink packaging machine, form and fill sealing machine, aseptic packaging systems, bottling machine, carton making machine, retort pouches, package printing machines.			
V	**Safety and legislative aspect of packaging** 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.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
VI	**SELF STUDY FOR ENRICHMENT** **(Not to be included for External Examination)** Advantages of ECO friendly - Sustainable and biodegradable packaging. Recycling of food packaging Materials. FSSAI- Function. Codex India.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.

Text Books

1. Subbulakshmi, G, Shobha A Udupi., (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

1. Ms. T.R. REVATHI
2. 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

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