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

B.Sc., NUTRITION AND DIETETICS

SYLLABUS

2022-2023 Onwards

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
B.Sc., NUTRITION AND DIETETICS PROGRAMME

PO NO	Programme Outcome On completion of B.Sc., Programme, the students will be able to
PO1	**ACADEMIC EXCELLENCE AND COMPETENCE** Elicit firm fundamental knowledge in theory as well as practical for coherent understanding of academic field to pursue multi and interdisciplinary science careers in future.
PO2	**HOLISTIC AND SOCIAL APPROACH** Create novel ideas related to the scientific research concepts through advanced technology and sensitivity towards sustainable environmental practices as well as social issues.
PO3	**PROFESSIONAL ETHICS AND TEAM WORK** Explore professional responsibility through project strategies, internships, field trip/industrial visits and mentorship programmes to transmit communication skills.
PO4	**CRITICAL AND SCIENTIFIC THINKING** Equip training skills in internships, research Projects to do higher studies in multidisciplinary path with higher level of specialization to become professionals of high-quality standards.
PO5	**SOCIAL RESPONSIBILITY WITH ETHICAL VALUES** Ensure ethical, social and moral values in the minds of learners and attain gender parity for building a healthy nation.

PROGRAMME SPECIFIC OUTCOMES FOR
B.Sc ., NUTRITION AND DIETETICS PROGRAMME `

PSO NO	Programme Specific Outcomes` Students of B.Sc., Nutrition & Dietetics will be able to	POs Addressed
PSO1	Apply the knowledge of food science, nutrition and dietetics to resolve the scientific issues and problems.	PO1
PSO2	Assess the nutritional status and recommend nutritional support and therapeutic care as sustainable approach for better health and prevention of diseases.	PO1, PO2
PSO3	Associate physiological, biochemical and microbiological parameters with health and diseases.	PO1
PSO4	Develop technical and human relation skills in relation to food services, demonstrate professional attributes required to manage the hospitality industry and to communicate effectively in the context of nutrition and dietetics.	PO3, PO4
PSO5	Demonstrate critical thinking skills and analytical abilities to identify and solve problems through internships and projects.	PO4, PO5

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

B.Sc., NUTRITION AND DIETETICS

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2022-2023 onwards)

Semester	Part	Course	Title	Course Code	Inst. Hrs. / week	Credits	Exam Marks Hrs.	Exam Marks Int	Exam Marks Ext	Total
I	I	Language Course – I (LC) – Tamil * / Other Languages *	Ikkala Ilakkiyam	22ULT1	6	3	3	25	75	100
			Hindi Literature & Grammar-1	22ULH1						
			History of Popular Tales, Literature and Sanskrit Story	22ULS1						
			Basic French	22ULF1						
	II	English Language Course-I(ELC)	Functional English for Effective Communication – I	22UE1	6	3	3	25	75	100
	III	Core Course – I(CC)	Food Science	22UND1CC1	5	5	3	25	75	100
		Core Practical - I (CP)	Food Science (P)	22UND1CC1P	3	3	3	40	60	100
		First Allied Course – I (AC)	Food Microbiology	22UND1AC1	4	3	3	25	75	100
		First Allied Course – II (AP)	Food Microbiology (P)	22UND1AC2P	4	3	3	40	60	100
	IV	Ability Enhancement Compulsory Course – I (AECC)	UGC Jeevan Kaushal - Universal Human Values	22UGVE	2	2	-	100	-	100
		TOTAL			**30**	**22**				**700**

II	I	Language Course – II (LC) – Tamil * / Other Languages *)	Idaikkala Illakiyamum Pudhinamum	22ULT2	5	3	3	25	75	100
			Hindi Literature & Grammar-1I	22ULH2						
			Poetry, Textual Grammar and Alankara	22ULS2						
			Basic French-II	22ULF2						
	II	English Language Course-II(ELC)	Functional English for Effective Communication – II	22UE2	6	3	3	25	75	100
	III	Core Course – II (CC)	Nutrition Through Life Span	22UND2CC2	5	5	3	25	75	100
		Core Practical - II (CP)	Nutrition Through Life Span (P)	22UND2CC2P	3	3	3	40	60	100
		Core Course -III (CC)	Macro and Micro Nutrients	22UND2CC3	3	3	3	25	75	100
		First Allied Course – III (AC)	Human Physiology	22UND2AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course – II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
		Ability Enhancement Compulsory Course - III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
		Extra Credit Course	SWAYAM ONLINE COURSE		As per UGC Recommendation					
		TOTAL			**30**	**23**				**800**

III	I	Language Course – III – Tamil * / Other uages *)	Kaapiyamum, Nadagamum	22ULT3	5	3	3	25	75	100
			Hindi Literature & Grammar-1II	22ULH3						
			Prose, Textual Grammar and Vakyarachana	22ULS3						
			Intermediate French-I	22ULF3						
	II	English Language Course-III(ELC)	Learning Grammar Through Literature - I	22UE3	6	3	3	25	75	100
	III	Core Course– IV(CC)	Diet Therapy I	22UND3CC4	6	6	3	25	75	100
		Core Practical - III(CP)	Diet Therapy I (P)	22UND3CC3P	3	3	3	40	60	100
		Second Allied Course- I (AC)	Nutritional Biochemistry	22UND3AC4	4	3	3	25	75	100
		Second Allied Course – II (AP)	Nutritional Biochemistry (P)	22UND3AC5P	4	3	3	40	60	100
	IV	Generic Elective Course– I (GEC)	Basics in Nutrition	22UND3GEC1	2	2	3	25	75	100
			Basic Tamil - I	22ULC3BT1						
			Special Tamil - I	22ULC3ST1						
		Extra Credit Course	SWAYAM ONLINE COURSE		As per UGC Recommendation					
		TOTAL			**30**	**23**				**700**

IV	I	Language Course – IV (LC) Tamil * / Other Languages*)	Pandaiya Ilakiyam	22ULT4	6	3	3	25	75	100
			Intermediate French-II	22ULF4						
			Hindi Literature & Functional Hindi	22ULH4						
			Drama, History of Drama Literature	22ULS4						
	II	English Language Course - IV(ELC)	Learning Grammar Through Literature - II	22UE4	6	3	3	25	75	100
	III	Core Course – V(CC)	Diet Therapy II	22UND4CC5	6	6	3	25	75	100
		Core Practical - IV(CP)	Diet Therapy II (P)	22UND4CC4P	4	4	3	40	60	100
		Second Allied Course – III (AC)	Food Chemistry	22UND4AC6	4	3	3	25	75	100
		Internship	Internship	22UND4INT	-	2	-	40	60	100
	IV	Generic Elective Course– II (GEC)	Meal Planning for the Family	22UND4GEC2	2	2	3	25	75	100
			Basic Tamil - II	22ULC4BT2						
			Special Tamil - II	22ULC4ST2						
		Skill Enhancement Course– I (SEC)	Basics in Food Production (P)	22UND4SEC1P	2	2	3	40	60	100
		Extra Credit Course	SWAYAM ONLINE COURSE		As per UGC Recommendation					
		TOTAL			**30**	**25**				**800**

15 Days INTERNSHIP during Semester Holidays

V	III	Core Course – VI(CC)	Food Processing and Preservation	22UND5CC6	6	6	3	25	75	100
		Core Practical – V(CP)	Food Processing and Preservation (P)	22UND5CC5P	3	3	3	40	60	100
		Core Course - VII(CC)	Basics in Research Methodology and Computer Applications	22UND5CC7	6	6	3	25	75	100
		Core Course – VIII(CC)	Community Nutrition	22UND5CC8	6	6	3	25	75	100
		Discipline Specific Elective – I (DSE)	A. Food Standards and Quality Control	22UND5DSE1A	5	4	3	25	75	100
			B. Food Product Development and Marketing	22UND5DSE1B						
			C. Front Office Management and Housekeeping	22UND5DSE1C						
	IV	Ability Enhancement Compulsory Course - IV (AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	Bakery and Confectionary (P)	22UND5SEC2P	2	2	3	40	60	100
		Extra Credit Course	SWAYAM ONLINE COURSE		As per UGC Recommendation					
		TOTAL			**30**	**29**				**700**

VI	III	Core Course – IX(CC)	Perspectives of Home Science	22UND6CC9	6	6	3	25	75	100
		Core Course – X(CC)	Food Service Management	22UND6CC10	5	5	3	25	75	100
		Core Course – XI(CC)	Cyber Security	22UGCS	5	4	3	25	75	100
		Core Practical – VI(CP)	Food Service Management (P)	22UND6CC6P	3	3	3	40	60	100
		Discipline Specific Elective – II (DSE)	A. Functional Foods and Nutraceuticals	22UND6DSE2A	5	4	3	25	75	100
			B. Sports Nutrition	22UND6DSE2B						
			C. Basics in Food Analysis	22UND6DSE2C						
		Project	Project Work	22UND6PW	5	4	-	-	100	100
	V	Gender Studies	Gender Studies	22UGGS	1	1	-	100	-	100
		Extension activity		22UGEA	0	1	0	-	-	-
		TOTAL			**30**	**28**				**700**
		GRAND TOTAL			**180**	**150**				**4400**

Courses & Credits for UG Science Programmes

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil/ Other Language	4	12	12
II	English	4	12	12
III	Core (Theory & Practical)	11 6	58 19	109
	Project Work	1	4	
	Internship	1	2	
	First Allied	3	9	
	Second Allied	3	9	
	DSE	2	8	
IV	GEC	2	4	15
	SEC	2	4	
	AECC-I -Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV Professional Skills	1	2	
V	Gender Studies	1	1	02
	Extension Activities	_	1	
		44		**150**

SEMESTER I	INTERNAL MARKS: 25			EXTERNAL MARKS:75
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UND1CC1	FOOD SCIENCE	CORE	5	5

Course Objectives

- To obtain knowledge on different food groups and their composition.
- To study the different methods of cooking.
- To understand the role of food groups in cookery.

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	Define and classify the food groups and different cooking methods	K1
CO 2	Explain structure, composition and processing of food groups	K2
CO 3	Relate the chemical reactions that occur during cooking and changes that occur during storage of fruits and vegetables	K3
CO 4	Associate properties and role of food groups in cookery	K4
CO 5	Infer the quality of egg and factors affecting tenderness of meat	K4

Mapping of CO with PO and PSO

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

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

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	**a. INTRODUCTION TO FOOD SCIENCE AND NUTRITIONAL CLASSIFICATION OF FOODS** Definition of Food Science, Basic Five Food Groups, Food Pyramid, Nutritional classification of foods – Energy yielding, body building, protective and regulatory foods. **b. CLASSIFICATION OF NUTRIENT** Macro Nutrients - Carbohydrate, Protein and Fat and Micro Nutrients – Vitamins, Minerals and its Sources. **c. COOKING METHODS** Objectives, different types cooking methods-moist, dry heat methods, microwave cooking, combination of cooking methods and, Recent methods of cooking – Ohmic cooking and induction cooking - merits and demerits.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	**a. CEREALS AND CEREAL PRODUCTS** Structure, composition, nutritive value and milling of wheat and parboiling of rice. Nutritional importance of millets - (maize, jowar, ragi, bajra), malting of cereals and role of cereals in cookery. **b. PULSES** Composition, nutritive value, factors affecting cooking quality of pulses, germination, role of pulses in cookery. **c. NUTS AND OILSEEDS** Composition, Nutritive value.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	**a. FRUITS** Classification, nutritive value, changes during ripening of fruits, enzymatic browning and methods of prevention, storage techniques. **b. VEGETABLES** Classification and nutritive value, pigments-fat-soluble, water-soluble, selection of vegetables, cooking of vegetables-changes during cooking, nutrient loss, effect of cooking on the pigments.	14	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

IV	**a. MILK AND MILK PRODUCTS** Composition, nutritive value, types of milk products- fermented milk products (Butter milk, Yogurt) and non - fermented milk products (Skim milk, Evaporated milk, sweetened condensed milk, Milk powder, Khoa, Ice cream). **b. EGG** Structure, composition and nutritive value, evaluation of quality of egg. **c. MEAT** Structure, composition, types of meat, cuts of meat,ageing and curing of meat, post mortem changes in meat, and tenderness of meat, meat cookery. **d. POULTRY** Composition, classification and nutritive value, poultry cookery. **e. FISH** Structure, composition, nutritive value, selection of fish, fish cookery.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	**a. FATS AND OILS** Composition, types of oils, functions, rancidity, hydrogenation, winterization, smoking point and role of fat or oil in cookery. **b. SUGAR** Nutritive value, sugar related products, stages of sugar cookery, crystallization, factors affecting crystallization. **c. SPICES AND CONDIMENTS** Uses of spices in Indian cookery and medicinal properties.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	**SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)** Solar cooking method- merits and demerits. Role of Nuts and oilseeds in cookery. Criteria of selection of fruits.Role of milk in cookery. Types of spices in Indian cookery.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

1. Potter, Norman, N., (2007), *Food Science*, (5th ed.), CBS Publications and distributors, New Delhi.
2. Shakuntala Manay, N., (2013). *Foods: Facts and Principles*, (3rd ed.), New Age International Publishers, New Delhi.
3. Swaminathan, M., (2019). *Advanced Text Book on Food and Nutrition*, Volume (2nd ed.), Bangalore Printing and Publishing Co. Ltd, Bangalore.
4. Mahatb, S., Bamji., Kamala Krishnasamy, Brahman, G.N.V., (2020) *Textbook of Human Nutrition*, (3rd ed.), Oxford and IBH Publishing Co. P. Ltd., New Delhi.

Reference Book

1. Sharma Jyoti, S., (2009). *Applied Nutrition and Food Science*. Akansha Publishing House, New Delhi.
2. Raheena Begum, M., (2015). *Textbook of Foods, Nutrition and Dietetics*. (3rd ed.), Sterling Publishers Pvt. Ltd, New Delhi.
3. Krause, M. V., Hunesher, M. A., (2013). *Food, Nutrition and Diet Therapy*. W. B. Saunders Company, Philadelphia, London.
4. Vickie, A., Vaclavik Elizabeth, W., Christian, (2014), *Essentials of Food Science*. (4th ed.), Springer Science and Business Media, New York.
5. Avantina Sharma, (2019). *Textbook of Food Science and Technology*. (3rd ed.), CBS Publishers and Distributors.

Web References:

1. https://www.scienceofcooking.com/
2. https://www.brainkart.com/article/Structure-of-cereal-grains_33949/
3. https://fruitsandveggies.org/stories/key-nutrients-that-protect/
4. https://pubmed.ncbi.nlm.nih.gov
5. https://journalofethnicfoods.biomedcentral.com

Journals:

1. Food Science and Nutrition, John Wiley and Sons Ltd publisher, United Kingdom.
2. Food and Nutrition Research, Co-Action Publishing, Sweden.
3. Journal of Food Science Education, Institute of Food Technologists publishing, United States.
4. Journal of the Science of Food and Agriculture, Wiley-Blackwell publishing, England.

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designers

MS. E. AGALYA

MS. C. NIVETHA

SEMESTER I	INTERNAL MARKS - 40		EXTERNAL MARKS - 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22UND1CC1P	FOOD SCIENCE (P)	CORE PRACTICAL	3	3

Course Objectives

- To gain knowledge in food groups.
- To compare weighing and measuring of raw and cooked food items.
- To formulate recipes by applying different cooking techniques.

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 various food groups and cooking techniques	K1
CO 2	Interpret weighing and measuring and compare weighment of raw and cooked food items	K2
CO 3	Prepare recipes from five food groups	K3
CO 4	Associate cooking methods with different food groups	K4
CO 5	Examine role of food groups in cookery	K4

Mapping of CO with PO and PSO

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

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

List of Experiments

1. Identification of ingredients from various food groups.
2. Weighing and measuring of raw and cooked food items.
3. Cereal Based Recipes: Idli, Chapathi, Poori, Vermicelli upma, Kozhukattai, Aloo paratha, Rice.
4. Millet Based Recipes: Ragi Vermicelli upma, Sathumavu mix, Millet ball, Millet pongal, Millet payasam.
5. Pulse Based Recipes: Sundal, Bholi, Green gram payasam, Dhal makhani, Vadai, Sambar and Sprouts salad.
6. Fruits Based Recipes: Fritters, Halwa, Salad, Milkshakes and Fresh juices.
7. Vegetables Based Recipes: Green leafy kootu, Avial, Stewed potato curry, Poriyal, Vegetable Salad, and Vegetable soup.
8. Milk Based Recipes: Paneer, Phirnee, Payasam, Ice cream and Basanthi.
9. Meat Based Recipes: Deep fried Chicken, Mutton gravy.
10. Fish Based Recipes: Steamed fish, Fish fry, Fish gravy.
11. Egg Based Recipes: Boiled, Scrambled and Poached egg, Curry and Omelette.

Text Books

1. Shakuntala Manay, N., (2013). *Foods: Facts and Principles*. (3rd ed.), New Age International Publishers. New Delhi.
2. Swaminathan, M., (2019). *Advanced Text Book on Food and Nutrition*. (2nd ed.), Bangalore Printing and Publishing Co. Ltd, Bangalore.

Reference Books

1. Vickie, A., Vaclavik Elizabeth, W., Christian, (2014). *Essentials of Food Science*, (4th ed.), Springer Science and Business Media, New York.
2. Raheena Begum, M., (2015). *Textbook of Foods, Nutrition and Dietetics*, (3rd ed.), Sterling Publishers Pvt. Ltd, New Delhi.
3. Avantina Sharma, (2019). *Textbook of Food Science and Technology*. (3rd ed.), CBS Publishers and Distributors.

Pedagogy:

E-content, Lecture, Power point presentation, Seminar, Assignment, Demonstration and Industrial visit

Web Links:

1. **https://www.scienceofcooking.com/**
2. **https://www.nios.ac.in/media/documents/SecHmscicour/english/Home%20Science%20(Eng)%20Ch-4.pdf**
3. **https://www.youtube.com/watch?v=QO_V3h14Fyc&ab_channel=SciShow**
4. **https://everydaynourishingfoods.com/how-to-cook-fluffy-millets/**

Course Designers:

- Ms. E. AGALYA
- Ms. C. NIVETHA

SEMESTER I	INTERNAL MARK : 25			EXTERNAL MARK : 75
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UND1AC1	FOOD MICROBIOLOGY	ALLIED	4	3

Course Objectives

- To acquire knowledge in relevance to microbiology and its applications in everyday life
- To learn various technique in food preservation.
- To understand the role of microorganisms in food industry and their beneficial effects.

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 fundamental principles pertaining to food microbiology	K1
CO2	Explain the preservation methods for the prevention of spoilage	K2
CO3	Predict microbial quality of food and water	K3
CO4	Relate the role of microbes in fermented food products	K3
CO5	Associate the benefits and hazards of microorganism	K4

Mapping of Co with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	2	2	3	3	3	3	3
CO2	2	2	3	2	2	3	3	2	2	2
CO3	2	2	3	2	2	3	3	2	2	3
CO4	2	2	3	3	2	3	3	3	3	3
CO5	2	2	3	2	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. INTRODUCTION TO MICROBIOLOGY** Microscope – Types and uses, classification of microorganisms – Prokaryotes and Eukaryotes. **b. MORPHOLOGY OF MICROORGANISMS** Virus, Fungi, Protozoa and Algae.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	**a. GROWTH AND MULTIPLICATION** Growth curve, batch culture and continuous culture, chemostat and turbidostat. **b. FACTORS AFFECTING GROWTH** Intrinsic factors -nutrient content, pH, redox potential, antimicrobial barrier and water activity Extrinsic factors - relative humidity, temperature and gaseous atmosphere.	12	CO1, CO2, CO3, CO4. CO5	K1, K2, K3, K4
III	**a. MICROBIOLOGY OF WATER** Bacteriological examinations, total count, test for E – Coli and Purification of water. Modern methods of purification – Reverse Osmosis, ultraviolet purification, activated carbon. **b. CONTROL OF MICROORGANISMS** Temperature – high, low, sterilization, irradiation. Chemical agents – Disinfectant, benzoates, sorbates, propionates, acetates, nitrates, nitrites, sulphur dioxide, sulphites, pickling, addition of sugar or salt, drying.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	**a. MICROBIOLOGY OF PERISHABLE FOODS** Contamination, spoilage and preservation of vegetables and fruits, milk and milk products, meat and meat products, egg, poultry, baked products and canned products. **b. MICROBIOLOGY OF NON - PERISHABLE FOODS** Contamination, spoilage and preservation of cereal and cereal products, pulses and legumes, sugar and sugar products.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	**a. BENEFICIAL EFFECTS OF MICROORGANISMS** Fermentation, Role of microorganisms in fermented foods - cheese, sauerkraut, and soy-based foods, factors controlling fermentation in foods. Probiotics and Prebiotics, **b. HAZARDS OF MICROORGANISMS** Food poisoning, food borne diseases – Salmonellosis, Botulism, Hepatitis, Amoebic dysentery.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	**SELF STUDY FOR ENRICHMENT** **(Not to be included for External Examination)** Morphology ofBacteria. Difference between chemostat and turbitostat. Role of salt and sugar in control of microorganism. List the microorganism responsible for spoilage in fruits and vegetables.Benefits of food preservation.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

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

1. http://airccse.org/journal/ijscai/papers/3214ijscai01.
2.https://www.biologydiscussion.com/microorganisms/microbes-microorganisms/microbes-in-the food-industry-microorganisms-biology/82587
3.https://www.rapidmicrobiology.com/test-method/theory-and-practice-of-microbiological-water-testing
4. https://academic.oup.com/femsle/article/362/20/fnv151/543071

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 Designers

- Ms. S. FATHIMA
- Ms. T.R. REVATHI

SEMESTER I	INTERNAL MARK : 40		EXTERNAL MARK : 60	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS/WEEK**	**CREDITS**
22UND1AC2P	**FOOD MICROBIOLOGY (P)**	**ALLIED PRACTICAL**	**4**	**3**

Course Objective

- To acquire knowledge on cultivation of microorganisms.
- To isolate microorganisms from food products.
- To evaluate number of microorganisms from food products.

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 instruments and their functions used for microbiological analysis	K1
CO2	Illustrate the preparation methods of culture media	K2
CO3	Classify the culture media techniques	K3
CO4	Distinguish potability of water	K4
CO5	Ascertain microorganism responsible for spoilage in different foods	K4

Mapping of Co with PO and PSO

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

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

List of Experiments

1. Instrumentation in microbiology laboratory and their function – Microscope, Shaker, Water bath.
2. Instrumentation in microbiology laboratory and their function – Autoclave, Hot air oven, Laminar air flow.
3. Instrumentation in microbiology laboratory and their function - Centrifuge, Calorimeter, Spectrophotometer.
4. Preparation of culture media.
5. Prepare pure culture techniques using spread plate method.
6. Preparation of culture techniques using streak plate method.
7. Prepare pure culture techniques using pour plate method.
8. Staining techniques - Simple and Differential.
9. Microbiological analysis of water.
10. Isolation of spoilage organisms from different food commodities.

Text Books

1. Vivek Kumar. (2011). *Laboratory manual of Microbiology*. Scientific Publishers (India)
2. Bharti Arora and D.R. Arora. (2007). *Practical Microbiology*. New Delhi CBS Publishers & Distributors.

Reference Books

1. Casida,L.E, J.R,(2012). *Industrial Microbiology.* New Age Publications. New Delhi.
2. Michael J Waites, Neil L Morgan. (2001). *Industrial Microbiology: An Introduction*. Blackwell Science Ltd.UK.
3. Rao,A.S. (2001). *Introduction to Microbiology.* Hall of India Private Ltd.New Delhi.

Web Links

1. http://microbiologysociety.org
2.https://ttk.elte.hu
3.https://www.futurelearn.com

Pedagogy:

Demonstration, E-content, Lecture, Power point presentation

Course Designers

- Ms. S. FATHIMA
- Ms. T.R. REVATHI

SEMESTER- II	INTERNAL MARKS: 25		EXTERNALMARKS:75	
COURSECODE	**COURSETITLE**	**CATEGORY**	**HRS / WEEK**	**CREDITS**
22UND2CC2	**NUTRITION THROUGH LIFE SPAN**	**CORE**	**5**	**5**

Course Objectives

- To learn about nutritional needs of various age group.
- To enable the students to plan menu.
- To acquire knowledge on physiological changes in various stages of life cycle.

Course Outcome and Cognitive Level Mapping

CO Number	**CO Statement** On the successful completion of the course, students will be able to	**Cognitive Level**
CO1	Identify national nutritional guidelines for various life stages.	K1
CO2	Describe physiological changes in various stages of life cycle.	K2
CO3	Relate nutritional care plan for all age groups.	K3
CO4	Associate nutritional strategies to combat the nutritional problems.	K4
CO5	Determine menu according to nutritional requirements of different age group.	K4

Mapping of CO with PO and PSO

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

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

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	**a) Fundamentals of Nutrition -** Basic five food groups, nutrient needs - Dietary Reference Intakes, RDA and dietary guidelines, my plate, balanced diet. **b) Menu planning** - Definition, principles of menu planning, points to be considered in menu planning, steps involved in planning menu, factors influencing meal planning.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	**a) Nutrition for Pregnancy** – Physiological changes during pregnancy, stages of pregnancy, nutritional assessment and guidance in prenatal care, importance of pre and periconceptional nutrition during pregnancy, nutritional problems, complications, food and nutritional requirements, dietary guidelines. **b) Nutrition for Lactation** – Role of hormones in milk production, factors affecting the volume and composition of breast milk, role of galactogogues, food and nutritional requirements, dietary guidelines, Lactation failure and factors responsible for lactation failure.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	**a) Nutrition for Infants-** Growth and development, importance of breast feeding, advantages of breast feeding, food and nutritional requirements. Weaning – definition, types of weaning and supplementary foods, points to be considered in introducing weaning	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	foods, problems faced while introducing weaning foods, complication in infant feeding - Low birth weight , artificial feeding, special children. **b) Nutrition for Preschoolers** – Growth and development, food and nutritional requirements, factors affecting nutritional status, low cost supplementary foods and nutritional problems among preschoolers.			
IV	**a) Nutrition for school going children** – Growth and development, food and nutritional requirements, packed lunch – factors to be considered, sample menu, school lunch programmes, nutritional problems. **b) Nutrition for adolescent** – Growth and development, body composition, puberty, secondary sexual characteristics, food and nutritional requirements, dietary guidelines, nutritional problems.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	**a) Nutrition for adulthood** – Food and nutritional requirements, dietary guidelines, nutritional problems. Nutrition and work efficiency. **b) Nutrition for Elderly** –Process of ageing, food and nutritional requirements, dietary guidelines, nutrition related problems, degenerative diseases.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	**SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)** Classification of nutrients. Traditional sources of lactogogues . Points to be considered while planning packed lunch for a school going child. Physiological changes during elderly.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Srilakshmi ,B (2014). *Dietetics*. New Age International. New Delhi
2. Gajalakshmi ,R (2014). *Nutrition Science.* CBS Publishers and Distributors Pvt. Ltd

Reference Books

1. Barasi, Mary E, Great Britain (2002). *Human Nutrition: Health Perspective* Hodder
2. Sari Edelstein (2009). *Life cycle nutrition*:*An Evidence- based Approach.* Jones and Bartlett Publisher.
3. Swaminathan M (2012). *Handbook of Food and Nutrition*. Bangalore Publishing Co. Ltd.
4. Gopalan.C, Rama Sastri.V.B and Balasuramanian.S.C (2020). *Nutritive Value of Indian Foods* National Institute of Nutrition (ICMR) Hyderabad.
5. Shubhangini A Joshi. (2021).*Nutrition and Dietetics*, McGraw-Hill Education (India) Pvt Limited New Delhi..5th ed
6. Ravinder Chadha and Pulkit Mathur.(2015).*Nutrition: A Lifecycle Approach.* The orient black swan.

Web Links

1.https://quizizz.com/admin/quiz/5fa0555b365e37001e0c688d/nutrition-through-the-lifecycle
2.http://213.55.90.4/admin/home/Dmu%20Academic%20Resource//Health%20Science/Nutrition%20and%20Food%20Science/2nd%20Year/Nutrition%20T
3.https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=NuAs6SreCGryddEfs4kkBA==
4.https://www.fda.gov/media/135301/download
5.https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=NuAs6SreCGryddEfs4kkBA==
6. https://egyankosh.ac.in/handle/123456789/31256

Journals

1. Journal of Nutrition and Metabolism, Biomed central, United Kingdom
2. Pregnancy Hypertension, Elsevier B.V, Netherlands

Pedagogy

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

Course Designers

Ms. S. FATHIMA
Ms. T.R. REVATHI

SEMESTER-II	INTERNAL MARKS: 40		EXTERNALMARKS:60	
COURSECODE	**COURSETITLE**	**CATEGORY**	**HRS / WEEK**	**CREDITS**
22UND2CC2P	**NUTRITION THROUGH LIFE SPAN (P)**	**CORE PRACTICAL**	**3**	**3**

Course Objectives

- To gain knowledge on nutritive value of Indian foods.
- To understand the importance of nutrition for various stages of life cycle.
- To plan meal for various stages of life cycle.

Course Outcome and Cognitive Level Mapping

CO Number	**CO Statement** On the successful completion of the course, students will be able to	**Cognitive Level**
CO1	Identify nutritive value of various foods	K1
CO2	Explain the importance of RDA for various stages of life cycle	K2
CO3	Prepare meal according to RDA	K3
CO4	Determine the nutrient content of the planned recipe	K4
CO5	Ascertain meal for various stages of life cycle	K4

Mapping of CO with PO and PSO

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

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

List of Experiments

1. Plan, calculate nutritive value and prepare meal for pregnant women.
2. Plan, calculate nutritive value and prepare meal for lactating women.
3. Plan, calculate nutritive value and prepare meal for an infant.
   Preparation of supplementary foods – Liquid, semi solid and solid.
4. Plan, calculate nutritive value and prepare meal for preschooler
5. Plan, calculate nutritive value and prepare meal for school going children
6. Plan, calculate nutritive value and prepare meal for an adolescent boy and an adolescent girl.
7. Plan, calculate nutritive value and prepare meal based low, moderate and high income for an adult man and an adult woman.
8. Plan, calculate nutritive value and prepare meal for elderly.

Text Books

1. Srilakshmi B (2014). *Dietetics New Age International*.New Delhi
2. Gajalakshmi R (2014). *Nutrition Science* CBS Publishers and Distributors Pvt. Ltd

Reference Books

1. Barasi, Mary E, Great Britain (2002). *Human Nutrition: Health Perspective* Hodder and Stoughton.
2. Sari Edelstein (2009). *Life cycle nutrition*. Lones and Bartlett Publisher.
3. Swaminathan M (2012). *Handbook of Food and Nutrition.* Bangalore Publishing Co Ltd
4. Gopalan.C, Rama Sastri.V.B and Balasuramanian.S.C (2016). *Nutritive Value of Indian Foods* National Institute of Nutrition (ICMR) Hyderabad

Web Links

1.https://www.tarladalal.com/recipes-for-healthy-pregnancy--369
2.https://www.indianhealthyrecipes.com/indian-baby-food-recipe/
3.https://poshan.outlookindia.com/story/poshan-news-healthy-recipes-for-adolescents/361731
4.https://www.tarladalal.com/recipes-for-senior-citizen-easy-to-chew-1028

Pedagogy

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

Course Designers

- Ms.S.FATHIMA
- Ms.T.R.REVATHI

SEMESTER – II	INTERNAL MARKS – 25		EXTERNAL MARKS - 75	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HOURS / WEEK**	**CREDIT**
22UND2CC3	**MACRO AND MICRO NUTRIENTS**	**CORE**	**3**	**3**

Course Objectives

- To gain knowledge on classification of nutrients.
- To get insight into the role of nutrients in maintaining health of the individual and community.
- To understand the inter-relationship of the various nutrients.

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 food sources of macro and micro nutrients	K1
CO2	Explain inter– relationship between health and nutrition	K2
CO3	Predict excess and deficiency effects of various nutrients	K3
CO4	Compute functions of macro and micro nutrients	K3
CO5	Determine water and electrolyte balance	K4

Mapping of CO with PO and PSO

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

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

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	a. **Introduction to Nutrition–** Inter-relationship between health and nutrition. Classification of nutrients-Macro and micro nutrients. b. **National and International recommendation for nutrient requirements**- WHO, FAO, ICMR. RDA– Definition, factors affecting RDA, general principles of deriving RDA.	**09**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	a. **Carbohydrates –** Nutritional classification, functions, sources, deficiency and excess effects. Dietary Fibre – definition, Classification. physiological and metabolic effect, role of fibre in prevention of diseases**.** b. **Energy Balance** – Units of measurement, determination of energy value of food, components of energy requirement, measurement of total energy requirements. Energy requirement during work. Specific Dynamic Action. Basal Metabolic Rate and factors affecting BMR.	**09**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	a. **Proteins –** Nutritional classification of proteins and amino acids, functions of proteins and amino acids, sources, deficiency and excess effects. Evaluation of protein quality. (PER, BV, NPU, CS) b. **Lipids –** Nutritional classification of lipids and fatty acids, Essential fatty acids, functions, deficiency and excess effects, health benefits of omega fatty acids.	**09**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3,K4,

IV	a. **Vitamins** - Fat Soluble Vitamins (A, D, E & K) - Functions, deficiency and excess effects. Water Soluble Vitamins (B complex & C) - Functions, RDA, sources, deficiency and excess effects. b. **Water** – Definition, distribution of water, functions, requirements, sources, water balance, maintenance of water balance, distribution of electrolytes, maintenance of electrolyte balance.	**09**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	a. **Minerals-Macro Minerals-** (Calcium, Phosphorus, Potassium, Sodium) - Functions, sources, deficiency and excess effects. b. **Micro Minerals** (Iron, Iodine, Fluorine) - Functions, sources, deficiency and excess effects.	**09**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	**SELF STUDY FOR ENRICHMENT** **(Not to be included for External Examination)** Definition of health, nutrition and nutritional status. Sources of dietary fibre. High biological value food sources. Role of water in human body. Interrelationship between nutrients.	**-**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Swaminathan, M. (1999). *Handbook of Food and Nutrition*. Bangalore Publishing Co Ltd, Bangalore.
2. Srilakshmi, B. (2017). *Nutrition Science*.New Age International(p)ltd. New Delhi.
3. Longvah, T.. Anandhan, R.,.Bhaskarachary, K. Venkaiah, K. (2017).*Indian Food Composition Table.* National Institute of Nutrition.

Reference books

1. Swaminathan, M. (1998).*Essentials of Food and Nutrition.* Bappco, Bangalore.
2. Vidya, Chintapalli. (1996*). Textbook of Nutrition*. Discovery Book Palace(p) Ltd, Chennai.
3. Berdanier, Carolyn, D. (2015). *Advanced Nutrition: Macronutrients, Micronutrients, and Metabolism.* Atlantic Publishers and Distributors. New Delhi.
4. Raheena Begum, M. (2009). *Textbook of Foods, Nutrition and Dietetics.* Sterling Publishers. New Delhi.
5. Martin Eastwood. (2013). *Principles of Human Nutrition.* Wiley Publishing.
6. Bamji Mahtab, S. (2017). *Textbook of Human Nutrition* (3rd ed.). Oxford & IBH Publishing Co Pvt Ltd. New Delhi.
7. Gopalan, C. (2011). *Dietary Guidelines for Indians.* Second Edition National Institution of Nutrition. Hyderabad.

Web links

1. **https://www.publichealthnotes.com/classification-of-nutrients-type-i-type-ii-macro-micro/**
2. **https://openoregon.pressbooks.pub/nutritionscience/chapter/1c-classification-of-nutrients/**
3. **https://www.medicalnewstoday.com/articles/161547#nutrition**
4. **https://www.healthline.com/nutrition/protein-deficiency-symptoms#TOC_TITLE_HDR_6**
5. **https://www.healthline.com/health/mineral-deficiency#What-are-the-symptoms-of-mineral-deficiency?**

Journals

1. Italian Journal of Pediatrics, Biomedical Central Ltd, Springer.
2. International Journal of Innovative Research and Reviews Erzurum, Turkey.
3. Journal of Food and Nutritional Disorders, London, United Kingdom

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designers

Ms. E.AGALYA

SEMESTER - II	INTERNAL MARKS: 25			EXTERNAL MARKS: 75
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS / WEEK**	**CREDITS**
22UND2AC3	**HUMAN PHYSIOLOGY**	**ALLIED**	**4**	**3**

Course Objectives

- To augment knowledge on anatomical perception of organs and its co-ordination with other organs.
- To study the structure of human organs.
- To understand the functions 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.	State composition, functions of blood and lymphatic system	K1
CO2.	Interpret structure and functions of organs in the body	K2
CO3.	Relate processes of the systems in the body	K3
CO4.	Classify tissue and explain its functions	K2, K3
CO5.	Examine structure and functions of endocrine and reproduction system	K4

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	**Blood and Circulatory System** a. Blood– Functions, Composition – Plasma, Cellular components; Red Blood Cells – Structure and functions, White Blood Cells – Types and function, Platelets. Haemoglobin – Structure and functions, Erythropoiesis, Blood coagulation. Blood groups and Rh Factor. b. Lymphatic System – Composition of lymph, structure and functions of lymphatic system- lymphoid tissue, lymph nodes.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	**Cardiovascular and Respiratory System** **a.** Heart and Circulation- Structure of heart and blood vessels, Properties of cardiac muscle, cardiac cycle, origin and conduction of heart beat, measurement of arterial blood pressure b. Respiratory System- Structure and functions of respiratory system – nasal cavity, pharynx, larynx, trachea, bronchi, bronchioles, alveoli and lungs. Mechanics of Respiration, Artificial Respiration.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	**Nervous System And Sense Organs** a. Nervous System- General classification of nervous system, Structural organization of nervous system – neuron, ganglion, neuroglia, nerves – classification - motor, sensory & mixed, structure and functions - spinal cord, brain - anatomy and functions of cerebrum, cerebellum, brain stem and medulla oblongata. b. Sense Organs- Structure and function of eye, ear, nose and tongue. c. Skin and Tissues- structure and functions of skin, tissues – classification: epithelial, connective, muscular and nervous and functions of tissue.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

IV	**Digestive System and Excretory System** a. Digestive system- Anatomy, Structure and Functions of mouth, pharynx, esophagus, stomach, Small intestine and large intestine. Digestive gland – salivary, liver, gall bladder and pancreas. Digestion in the mouth, stomach and intestines. Movements of the intestine. b. Excretory system- Physiology of the Urinary System- kidney, nephron, ureter, urinary bladder, urethra. Composition of urine, formation of urine, micturition.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	**Endocrine and Reproductive system** a. Endocrine System- Structure and functions of thyroid, pituitary, parathyroid, Adrenals, islets of langerhans of pancreas b. Reproductive System-Anatomy of the male and female reproductive organs, menstrual cycle, mammary glands, Fertilization, Development of Embryo, Pregnancy and parturition.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	**SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)** Functions of blood, Structure of heart, Basic functions of sense organs, Hunger mechanism, Amenorrhea.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

RELATED EXPERIENCE

- Histology of Tissues – Columnar, cubical, ciliated, squamous, stratified squamous.
- Microscopic structure of organs – lungs, artery, vein, stomach, ovary, testis, uterus, pancreas.
- Histology of muscles – cardiac, striated, non –striated
- Estimation of Haemoglobin (Shali's method)
- Determination of Bleeding time (Duke method)
- Determination of Clotting time (Capillary method)
- Measurement of Blood pressure – before and after exercise
- Determination of Pulse rate – before and after exercise.
- Determination of Blood group and Rh factor

Text Books

1. Sembulingam. (2016). *Essentials of Medical Physiology*. Health Sciences Publisher. New Delhi.
2. Subramanyam., Sarada. (2018). *Textbook of Human Physiology*. S.Chand and company Ltd, New Delhi.
3. Randhawa.S.S., Atul Kabra.(2017). *Human Anatomy and Physiology*-I. S.Vikas and Company, India.
4. Murugesh.N. (2010). *Anatomy Physiology and Health Education*.(6th ed.).

Reference Books

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

Journals

1.Human Physiology, Maik Nauka / Interperiodica Publishing, Russian Federation.

2.Indian Journal of Clinical Anatomy and Physiology, Innovative publication Pvt. LTD, India.

3.American Journal of Physiology - Endocrinology and Metabolism, American Physiological Society, United States.

4.Canadian Journal of Physiologyand Pharmacology, Canadian Science Publishing, Nrc Research Press, Canada.

Web links

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

Pedagogy

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

Course Designers

- Ms. B. THANUJA
- Ms. S. AGALYA

SEMESTER III	INTERNAL MARKS:25		EXTERNAL MARKS:75	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS/ WEEK**	**CREDITS**
22UND3CC4	**DIET THERAPY I**	**CORE**	**6**	**6**

Course Objectives

- To know the principles of diet therapy
- To study the metabolic changes of disease conditions
- To understand the modification of normal diet for therapeutic purposes

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 role and responsibilities, skills, ethics and opportunities for a dietician	K1
CO 2	Explain the principles of diet therapy, drug nutrient interaction and special feeding methods	K2
CO 3	Relate the causes, symptoms and complications of diseases	K3
CO 4	Compute nutritional care for food allergy and children with special needs	K3
CO 5	Ascertain dietary principles in planning and preparing diet for various diseases and compute nutritive value	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	-	3	2	-	-	-
CO2	3	3	3	-	-	3	2	-	-	-
CO3	3	3	3	-	-	3	2	-	-	-
CO4	3	3	3	-	-	3	2	-	-	-
CO5	3	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	**a) Dietitian** Definition and classification of dietitian. Qualities and responsibilities of dietitian. Role of dietitian in hospitals and community. Professional ethics and code of conduct of dietitian. **b) Diet therapy** Definition, principles of a therapeutic diet. Routine Hospital diets and progressive modifications - Clear fluid diet, Full fluid diet, Soft diet, regular normal diet, bland diet. Specially modified therapeutic diets – High and low calorie, high and low protein, high and low residue diets, high and low fat diets.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	**a) Drug nutrient interaction** Modification of diet according to medical prescription – Diet effects on drug disposition, drug effects on nutrients and interaction of drugs. **b) Special feeding methods** Enteral and Parenteral feeding- Indications, types (oral supplements, tube feeding, parenteral feeding, TPN, pre and post-operative diets) methods of administration, monitoring and associated complications.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	**a) Nutritional care for diseases of gastro intestinal tract** Peptic ulcer, Diarrhoea, Constipation, Haemorrhoids and Malabsorption syndrome – aetiology, symptoms, clinical findings and dietary modifications. **b) Nutritional care for febrile condition** Metabolic changes during fever and types of fever (acute and chronic), causes, clinical features and dietary management of Typhoid, Influenza , Malaria, Tuberculosis and HIV.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

IV	**a) Nutritional care for diseases of biliary system** Jaundice, Fatty liver, hepatitis, cirrhosis and Hepatic coma- etiology, symptoms and clinical findings and dietary management. Cholelithiasis and Cholecystitis- etiology, symptoms and dietary management. **b) Nutritional care for obesity and underweight** Obesity and overweight- Definition, etiology, theories of obesity, types, metabolic changes, assessment, complications, prevention and dietary treatment Underweight-Definition, etiology, prevention and dietary treatment.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	**a) Nutritional care for allergy** Definition, food allergens, clinical manifestations, diagnosis of food allergy and dietary advice. **b) Nutritional care for the children with special needs** Down's syndrome, Cerebral Palsy, Autism, Attention Deficit Hyperactivity Disorder - Overview of the disability and nutritional care, feeding difficulties and special feeding equipment.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	**SELF STUDY FOR ENRICHMENT** **(Not to be included for External Examination)** Indian Dietetic Association-Activities, Comparison of enteral and parenteral nutrition, Nutritional care for pandemic fevers, Grading of obesity, Food induced anaphylaxis.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Srilakshmi B.(2019). *Dietetics.*(8th ed)New Age International. New Delhi.
2. Sangeetha Karnik. (2010). *Nutrition and Diet Therapy.*Biotech Pharma Publications.
3. Sumati R Mudambi. (2012).*Fundamentals of Foods, Nutrition and Diet Therapy. (* 6th ed).New Age International, New Delhi.
4. De Bruyne, Pinna, Whitney. (2012).*Nutrition and Diet Therapy*. (8th ed). Library of Congress.
5. Avantina Sharma. (2017).*Principles of Therapeutic Nutrition and Dietetics.*CBS Publishers and Distributors.

Reference Books

1.Mahatb, S., Bamji., Kamala Krishnasamy, Brahman, G.N.V., (2020).*Textbook of Human Nutrition*. (3rd ed.). Oxford and IBH Publishing Co. P. Ltd., New Delhi.

2.Raheena Begum, M. (2015). *Textbook of Foods, Nutrition and Dietetics*. (3rd ed.). Sterling Publishers Pvt. Ltd. New Delhi.

3.Krause, M. V. Hunesher, M. A. (2013). *Food, Nutrition and Diet Therapy*. W. B. Saunders Company. Philadelphia. London.

4.Kathleen ML. and Escott S.(2000) .*Krause'sFood, Nutrition and Diet Therapy*. (9thed.). W.B. Saunders Company Pennsylvania.

Web links

- https://www.sciencedirect.com/topics/medicine-and-dentistry/full-liquid-diet
- https://www.webmd.com/allergies/allergies-elimination-diet
- https://www.iffgd.org/upper-gi-disorders.html
- https://pinnt.com/Enteral-Nutrition.aspx
- https://www.urmc.rochester.edu/childrens-hospital/nutrition/special-needs.aspx

Journals

1.Canadian Journal of Dietetic Practice and Research, Dieticians Canada, Canada
2.Journal of Human Nutrition and Dietetics, Wiley-Blackwell, England
3.Journal of the Academy of Nutrition and Dietetics, Elsevier
4.Journal of Human Nutrition and Dietetics, Wiley online library, UK
5.Nutrition and Health-SAGE Journals

Pedagogy

Lecture, Chalk and Talk, Seminar, Assignment, E-Content, PowerPoint Presentation, Quiz.

Course Designers

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

SEMESTER III	INTERNAL MARKS:40	EXTERNAL MARKS:60		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22UND3CC3P	DIET THERAPY I (P)	CORE PRACTICAL	3	3

Course Objectives

- To understand the modification of normal diet for therapeutic purpose
- To calculate nutritive value based on therapeutic modification
- To acquire the skills of preparing diet for various disease conditions

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	Define therapeutic diet and state characteristics of routine hospital diets such as clear liquid diet, full liquid diet and soft diet	K1
CO 2	Explain the basic principles involved in planning diets for different disease conditions.	K2
CO 3	Relate practical knowledge of therapeutic diet to meet the requirement of diet therapy	K3
CO 4	Prepare diets to meet out the quality and quantity requirements for specific disease conditions	K3
CO 5	Infer dietary principles in planning and preparing diet for various diseases and compute nutritive value	K4

Mapping of CO with PO and PSO

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

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

List of Experiments

1. Planning and Preparation of Therapeutic diets
   - Clear liquid diet
   - Full liquid diet
   - Soft diet
2. Planning and Preparation of diet for
   - Peptic ulcer
   - Diarrhoea
   - Constipation
3. Planning and Preparation of diet for Fevers
   - Typhoid
   - Tuberculosis
4. Planning and Preparation of diet for
   - Obesity
   - Under weight
5. Planning and Preparation of diet for
   - Hepatitis
   - Cirrhosis
6. Visit to hospital dietary units

Text Books

1. Srilakshmi B. (2019). *Dietetics.*(8th ed)New Age International, New Delhi.
2. F. P. Antia& Philip Abraham. (2002).*Clinical Dietetics and Nutrition. (*4th ed). Oxford University Press.

Reference Books

1. Barasi, Mary E, Great Britain (2002). *Human Nutrition: Health Perspective* Hodder and Stoughton.
2. Gopalan.C. Rama Sastri.V.B and Balasubramanian.S.C. (2017). *Nutritive Value of Indian Foods* National Institute of Nutrition (ICMR) Hyderabad.

Web links

- https://vikaspedia.in/health/nutrition/dietary-guidelines-1/avoid-overeating-to-prevent-overweight-and-obesity
- https://www.youtube.com/watch?v=aa9bvQtJv6s
- https://www.youtube.com/watch?v=9EUFrKdmd5U

Pedagogy

Lecture, Chalk and Talk, Demonstration, Practical, E-Module, Visit to hospital dietary unit.

Course Designers

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

SEMESTER III	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS / WEEK**	**CREDITS**
22UND3AC4	**NUTRITIONAL BIOCHEMISTRY**	**ALLIED**	**4**	**3**

Course Objectives

- To acquire knowledge on basic concepts of biochemical reactions
- To understand the biochemical reactions involved in the metabolism of various nutrients in the body
- To comprehend the mode of action of different enzymes in cell

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On Successful Completion of the course, students will be able to	Cognitive Level
CO1	State the structure, classification, properties and functions of macro and micro nutrients	K1
CO2	Illustrate on the cellular functions for maintaining the homeostasis	K2
CO3	Describe enzyme activity in the metabolic action	K2
CO4	Predict the anabolic and catabolic mechanism of nutrients	K3
CO5	Associate the effect of free radicals and gene on nutrient metabolism	K4

Mapping of CO with PO and PSO

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

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

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SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	**a) Cell** Introduction, cell organelles, cell membrane, movement of the substances and water through the cell membrane, bioelectric potentials. **b) Enzymes** Definition, classification of enzymes, Coenzyme, Role of B-vitamins as coenzyme, factors affecting enzyme activity, enzyme inhibition. **c)Hormones** Protein hormones , steroid hormones.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	**a) Protein** Amino acids classification, structure, properties, protein structure, peptide linkage, covalent backbone, three-dimensional conformation, quaternary structure of oligomeric proteins. Determination of –N and –C terminal amino acids, protein functions. Hormonal regulation of protein metabolism. Protein metabolism- synthesis of proteins and metabolism of amino acids. **b) Nucleotides and nucleic acids** Structure of purine and pyrimidines nucleotides, DNA, RNA – structure and types, biosynthesis and catabolism of purine and pyrimidine nucleotide	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	**a) Carbohydrates** Classification, structure, properties and functions. Hormonal regulation of carbohydrate metabolism. Carbohydrate metabolism – glycolysis, HMP shunt pathway, TCA cycle, gluconeogenesis from TCA intermediates/ amino acids/ acetyl CoA, concept of glycogenesis and glycogenolysis. Glucose homeostasis. **b) Lipids** Classification, structure, properties, biological significance, Bioenergetics – electron transport and oxidative	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	phosphorylation, redox potential, high energy compounds. Hormonal regulation of lipid metabolism. Lipid metabolism – Alpha, omega, beta oxidation of fatty acids, biosynthesis of fatty acids.			
IV	**a) Vitamins** Fat Soluble Vitamins – A,D,E,K and its metabolism. Water Soluble – B,C and its metabolism. **b) Minerals -**Macro Minerals – Calcium, Phosphorus, Sodium, Potassium, Magnesium and its metabolism. Micro Minerals – Iron, Fluorine, Zinc, Iodine, Selenium and its metabolism.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	**a) Free radicals and antioxidants** Definition, Formation in biological systems. Antioxidants– definition, classification – enzymatic and non-enzymatic. **b) Nutrigenomics** Definition, Scope, effects of nutrients on gene expression – direct interactions, epigenetic interactions, genetic variations.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	**SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)** Functions of enzymes, Role of hormones in nutrient metabolism, Classification of fatty acids, Synergetic mechanism of nutrients, Functions of antioxidants.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1.Sucheta PDandekai.(2000).*Medical Biochemistry.*B.I.Churchill Livingstone.
2. Lauralee Sherwood.(2007). *Human Physiology*(6th Ed). Brooks Cole Publishing Co.
3. AmbikaShanmugam.(2008).*Fundamentals of Biochemistry for Medical students.*Lippincott Williams & Wilkins.
4. Rafi MD.(2015).*Textbook of Biochemistry for Medical Students.* University of Health Sciences. University Press.

Reference Books

1. Patricia Trueman.(2007).*Nutritional Biochemistry.* MJP Publishers.
2. Mallikarjuna Rao N.(2008).*Medical Biochemistry.*S.Chandand Company Ltd. NewDelhi.
3. Jain J L.(2008).*Fundamentals of Biochemistry.*S.Chandand Company Ltd.New Delhi.
4. Robert k Murray.(2009).*Harper's Illustrated Biochemistry.*McGraw Hill.
5. John E Hall.Guyton&Hall.(2013).*Text Book of Medical Physiology*.Elsevier India Private Limited. New Delhi.
6. Agarwal G R Meerut.(2014).*Text Book of Biochemistry.*Krishnaprakashan Media (P) Ltd.
7. SatyanarayananU.(2014).*Biochemistry.* Elsevier India Private Limited.New Delhi.

Web links

- https://opentextbc.ca/anatomyandphysiology/chapter/24-4-lipid-metabolism/
- https://www.ncbi.nlm.nih.gov/books/NBK9921/
- https://vikaspedia.in/health/nutrition/antioxidants/antioxidant-and-their-medicinal-applications

Journals

1. Journal of Nutritional Biochemistry, Elsevier Science Inc, United States
2. Biochemistry, American Chemical Society, United States

Pedagogy

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

Course Designers

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

SEMESTER III	INTERNAL MARKS: 40	EXTERNAL MARKS: 60		
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UND3AC5P	NUTRITIONAL BIOCHEMISTRY (P)	ALLIED PRACTICAL	4	3

Course Objective

- To develop skills in handling analytical equipment
- To understand the procedures of qualitative analysis
- To learn the analytical techniques of quantitative analysis

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On Successful Completion of the course, students will be able to	Cognitive Level
CO1	Identify the chemicals used for qualitative and quantitative analysis	K1
CO2	Illustrate qualitative and quantitative analysis	K2
CO3	Prepare reagents for qualitative and quantitative analysis	K3
CO4	Predict the procedure involved in qualitative and quantitative analysis	K3
CO5	Infer the results	K4

Mapping of CO with PO and PSO

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

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

List of Experiments

1. Qualitative tests for Sugars -Glucose, Fructose, Lactose, Maltose, Sucrose, Starch.
2. Qualitative tests for Proteins.
3. Qualitative tests for Minerals.
4. Quantitative estimation of Glucose – Benedicts method
5. Quantitative estimation of Iron – Titration method
6. Quantitative estimation of Calcium – Titration method
7. Quantitative estimation of Ascorbic acid- Colorimetry
8. Technique of Chromatography (Paper)
9. Electrophoretic pattern of blood proteins (Demonstration)

Text Books

1. Ambika Shanmugam(2008).*Fundamentals of Biochemistry for Medical students.* Lippincott Williams Wilkins
2. Pattabiraman .N.T(2001).*Laboratory Manual in Biochemistry*.All India Publishers and Distributors Regd,Chennai

Reference Books

1. Shanmugam.S, Sathishkumar,T, PanneerSelvam. K.(2010).*Laboratory handbook on biochemistry*. PHI learning Private Ltd,Chennai.
2. Evangeline Jones.(2016). Manual of Practical Medical Biochemistry,(2nd ed).Jaypee Brothers Medical Publishers(p) Ltd.

Web links

- https://opentextbc.ca/anatomyandphysiology/chapter/24-4-lipid-metabolism/
- https://www.ncbi.nlm.nih.gov/books/NBK9921/

Pedagogy

E-content, Lecture, Demonstration, Power point presentation.

Course Designers

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

SEMESTER III	INTERNAL MARKS :25		EXTERNAL MARKS :75	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HOURS / WEEK**	**CREDIT**
22UND3GEC1	**BASICS IN NUTRITION**	**GENERIC ELECTIVE**	**2**	**2**

Course Objectives

- To gain basic knowledge on classification of nutrients
- To get insight into the role of nutrients in maintaining health
- To understand importance of nutrition education

Course Outcomes

CO Number	**CO statement** On the successful completion of the course, students will be able to	**Cognitive Level**
CO1	Define nutrition and Recommended Dietary Allowances	K1
CO2	Explain classification of nutrients and objectives of nutritional programmes	K2
CO3	Illustrate the sources, requirement, functions, deficiency and excess effect of nutrients	K2
CO4	Predict the methods of nutritional assessment	K3
CO5	Ascertain techniques involved in nutrition education	K4

Mapping of CO with PO and PSO

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

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

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	**a)Nutrition and Health**- Definition of Nutrition and Health, Importance of nutrition for health, Basic five food group, My plate and the functions of food. **b) Nutrients and RDA**-Definition and classifications of nutrients, RDA, factors affecting RDA.	**4**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	**a)Carbohydrates** – Nutritional classification, functions, requirement, excess and deficiency effects. Role of dietary fibre in human nutrition, **b) Protein** – Nutritional classification, functions, sources, requirement, excess and deficiency disorders. Amino acids-Classification and functions. **c) Lipids** – Classification, functions, sources, requirement, excess and deficiency effects. Fatty acids – Classification and functions.	**8**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	**a)Vitamins** – Fat soluble vitamins -A, D, E and K - functions, sources, requirements excess and deficiency disorders, Water soluble vitamins – Vitamin C and B vitamins (Thiamine, Riboflavin, Niacin, Pyridoxin, Folic acid, B12) - functions, sources, requirement, excess and deficiency disorders. **b) Minerals** – Calcium, Phosphorus, Sodium, Potassium, Iron, Iodine, Fluorine - functions, sources, requirement, excess and deficiency disorders.	**8**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	**a) Basics of assessing nutritional status :Direct method** -Anthropometric measurements (BMI, WHR, Broca's Index), Biochemical and Clinical assessment. **b) Indirect method** - Dietary Survey (24-hour dietary recall, food frequency questionnaire, diet history, dietary record),Vital statistics.	**6**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

V	**a) Nutrition education –**Definition**, t**ools, steps, importance of nutrition education. Nutrition education for prevention of underweight, obesity, anaemia. **b) Nutrition intervention programmes in India** - Nutritional Anaemia Prophylaxis Programme, National Prophylaxis Programme against Vitamin A Deficiency Diseases, National Goitre Control Programme, Integrated Child Development Services (ICDS).	**4**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	**SELF STUDY FOR ENRICHMENT** **(Not to be included for External Examination)** Food pyramid, Sources of energy, Functions of water in human body and water balance, Importance of assessment of nutritional status, PEM-Types and symptoms.	**-**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1.Srilakshmi B.(2021). *Nutrition Science.*(7th ed) New Age International Publishers. New Delhi.
2.Swaminathan.M. (2018). *Hand book of Food and Nutrition*.Bangalore Printing and Publishing Co Ltd. Bangalore
3.Raheena Begum.M. (2019).*A Text Book of Foods. Nutrition and Dietetics.*(3rd revised ed). Sterling Publishers Private Limited.

Reference Books

1. Gajalakshmi R. (2018). *Nutrition Science.*(2nd ed). CBS Publishers and distributors Pvt Ltd. New Delhi, India.
2. IndraniT.K. (2017).*Nursing Manual of Nutrition and Therapeutic Diet.*(2nd ed). Jaypee Brothers Medical publishers (P) Ltd, New Delhi.
3. SunetraRoday. (2018).*Food Science and Nutrition*(3rd ed).Oxford University press, New Delhi, India.

Web links

- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3995129/
- http://www.tuscany-diet.net/carbohydrates/classification-functions/
- https://www.nia.nih.gov/health/vitamins-and-minerals

Journals

1. Journal of the Korean Society of Food Science and Nutrition, Korean Society of Food Science and Nutrition, South Korea.
2. Food and Agricultural Immunology, Taylor & Francis, England.
3. Nutrition and Food Science, Emerald Group Publishing Ltd, United Kingdom.

Pedagogy

E-content, Lecture, Power Point Presentation, Seminar, Assignment

Course Designers

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

SEMESTER IV	INTERNAL MARKS:25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22UND4CC5	DIET THERAPY II	CORE	6	6

Course Objectives

- To learn role of dietary treatment in the management of disease conditions.
- To know the principles of dietary management.
- To know the role of computers in management of dietary practice.

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	Define the causes, symptoms and complications of diseases.	K1
CO 2	Explain the application of dietary principles in the management of various diseases and compute nutritive value.	K2
CO 3	Interpret the role of nutraceuticals in the prevention of diseases.	K2
CO 4	Apply the steps in diet counselling process	K3
CO 5	Examine the importance of computers in nutrition practice.	K4

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	2	3	3	2
CO2	3	3	3	2	3	3	2	3	3	2
CO3	3	3	3	2	3	3	2	3	3	2
CO4	3	3	3	2	3	3	2	3	3	2
CO5	3	3	3	2	3	3	2	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	**a) Nutritional care for Diabetes Mellitus:** Aetiology and predisposing factors, symptoms, types, diagnostic and screening criteria, complications, food exchange list, glycemic index, glycemic load treatment and dietary modifications. **b) Nutritional care for Hormonal diseases:** aetiology, symptoms, and dietary modification for – Cushing's syndrome, Addison's disease, hypothyroidism and hyperthyroidism.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	**a) Nutritional care for cardiovascular diseases:** Hyperlipidaemia, Hypertension, Atherosclerosis and Congestive cardiac failure - aetiology, clinical findings and dietary management. **b) Nutritional care for Neoplastic Diseases:** Cancer – Types, stages and markers. Nutrition in the etiology of cancer. Nutritional effects of cancer and cancer therapy, nutritional care of cancer patients.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	**a) Nutritional care for diseases of the musculoskeletal system:** Arthritis, Osteoporosis and Gout - meaning, symptoms, causes, treatment and dietary management **b)Nutritional care for burns: Types, causes,** pathophysiology, medical nutrition therapy.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	**a)Nutritional care for Renal diseases:** Nephritis, Nephrosis, Renal failure and Urinary calculi - Predisposing factors, symptoms and dietary management. Dialysis -types, and modification of diet in dialysis. **b) Nutritional care for Inborn errors of metabolism:** Phenylketonuria, Galactosemia and Fructosuria, Niemann – pick disease – causes, symptoms, and dietary management.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

V	**a)Nutrition care process and Dietary Counseling**- Nutrition Care Process: Definition, Steps of Nutrition Care Process. Dietary counselling: clients and counselors, client responsibility, attributes of a successful counselor, steps in counseling process, counseling guidelines. **b) Computers in Management of Nutrition Practice:** General information – data input, data output, data analysis, data communication, clinical care – communication in patient care and nutritional therapy, Computer application in Preparation of dietary charts for patients.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	**SELF STUDY FOR ENRICHMENT** **(Not to be included for External Examination)** Uses of food exchange list, Side effects of cancer treatment, Relate structure of skin with types of burns, Dietary Management after renal transplantation, Application of artificial intelligence and computer applications in dietetics practice	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Srilakshmi B.(2019). *Dietetics.*(8th ed)New Age International. New Delhi.
2. Sangeetha Karnik. (2010). *Nutrition and Diet Therapy.*Biotech Pharma Publications.
3. Sumati R Mudambi. (2012).*Fundamentals of Foods, Nutrition and Diet Therapy. (* 6th ed).New Age International, New Delhi.
4. De Bruyne, Pinna, Whitney. (2012).*Nutrition and Diet Therapy*. (8th ed). Library of Congress.
5. Avantina Sharma. (2017).*Principles of Therapeutic Nutrition and Dietetics.*CBS Publishers and Distributors.

Reference Books

1.Mahatb, S., Bamji., Kamala Krishnasamy, Brahman, G.N.V., (2020).*Textbook of Human Nutrition*. (3rd ed.). Oxford and IBH Publishing Co. P. Ltd., New Delhi.

2.Raheena Begum, M. (2015). *Textbook of Foods, Nutrition and Dietetics*. (3rd ed.). Sterling Publishers Pvt. Ltd. New Delhi.

3.Krause, M. V. Hunesher, M. A. (2013). *Food, Nutrition and Diet Therapy*. W. B. Saunders Company. Philadelphia. London.

4.Kathleen ML. and Escott S.(2000) .*Krause'sFood, Nutrition and Diet Therapy.* (9thed.). W.B. Saunders Company Pennsylvania.

Web links

- https://www.nutrition.org.uk/nutritionscience/health-conditions/heart-disease.html
- https://www.medanta.org/severe-burns/
- https://labtestsonline.org/conditions/kidney-disease
- https://www.medicinenet.com/diabetes_mellitus/article.htm
- http://www.fao.org/3/W0795T/w0795t03.htm
- https://vikaspedia.in/health/nutrition

Journals

1.Canadian Journal of Dietetic Practice and Research, Dieticians Canada, Canada
2.Journal of Human Nutrition and Dietetics, Wiley-Blackwell, England
3.Journal of the Academy of Nutrition and Dietetics, Elsevier
4.Journal of Human Nutrition and Dietetics, Wiley online library, UK
5.Nutrition Research, Elsevier Science Ltd, United States.
6. European Journal of Clinical Nutrition

Pedagogy

Lecture, Chalk and Talk, Seminar, Assignment, E-Content, PowerPoint Presentation, Quiz.

Course Designers

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

SEMESTER IV	INTERNAL MARKS:40			EXTERNAL MARKS:60
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22UND4CC4P	DIET THERAPY II (P)	CORE PRACTICAL	4	4

Course Objectives

- To understand the modification of normal diet for therapeutic purpose.
- To acquire the skills of preparing diet for various disease conditions.
- To gain experience in diet counselling for different health conditions.

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	Describe knowledge on therapeutic diets	K1
CO 2	Interpret nutrition principles in to the treatment and prevention of diseases.	K2
CO 3	Implement diagnostic and treatment measures through the nutrition care Process.	K3
CO 4	Determine principles and importance of therapeutic diets for various diseases	K4
CO 5	Examine tools for diet counselling	K4

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	2	3	3	2
CO2	3	3	3	2	3	3	2	3	3	2
CO3	3	3	3	2	3	3	2	3	3	2
CO4	3	3	3	2	3	3	2	3	3	2
CO5	3	3	3	2	3	3	2	3	3	2

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

List of Experiments

1. Planning, preparation and diet counselling for Diabetes Mellitus
    - Insulin Dependent Diabetes Mellitus (IDDM)
    - Non Insulin Dependent Diabetes Mellitus (NIDDM)
    - Gestational Diabetes Mellitus (GDM)
2. Planning, preparation and diet counselling for Cardio Vascular Diseases
    - Hypertension
    - Atherosclerosis
3. Planning, preparation and diet counselling for musculoskeletal disorders
    - Gout
    - Osteoporosis
4. Planning, preparation and diet counselling for renal diseases
    - Nephritis
    - Nephrosis
5. Planning, preparation and diet counselling for
    - Burns
    - Cancer

Text Books

1. Srilakshmi B. (2019). *Dietetics.*(8th ed)New Age International, New Delhi.
2. F. P. Antia& Philip Abraham. (2002).*Clinical Dietetics and Nutrition. (*4th ed). Oxford University Press.

Reference Books

1. Barasi, Mary E, Great Britain (2002). *Human Nutrition: Health Perspective* Hodder and Stoughton.
2. Gopalan.C. Rama Sastri.V.B and Balasubramanian.S.C. (2017). *Nutritive Value of Indian Foods* National Institute of Nutrition (ICMR) Hyderabad.

Web links

- https://www.ncbi.nlm.nih.gov/books/NBK482514/
- https://diabetesjournals.org/care/article/42/5/731/40480/Nutrition-Therapy-for-Adults-With-Diabetes-or
- https://www.jrnjournal.org/

Pedagogy

Lecture, Chalk and Talk, Demonstration, Practical, E-Module.

Course Designers

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

SEMESTER IV	INTERNALMARKS:25			EXTERNALMARKS:75
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UND4AC6	FOOD CHEMISTRY	ALLIED	4	3

- To gain insight into the chemistry of foods
- To understand the scientific principles involved in food preparation
- To understand the various properties exhibited by foods

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 physical and chemical properties of food	K1
CO2	Explain the structural and textural changes of food during cooking	K2
CO3	Predict the cooking quality of various food groups	K3
CO4	Determine pigments and enzymes present in food	K3
CO5	Infer the uses of food additives and leavening agent	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	1	2	3	3	3	3	3	1
CO2	3	1	1	2	3	3	3	3	3	1
CO3	3	1	1	2	3	3	3	3	3	1
CO4	3	1	1	2	3	3	3	3	3	1
CO5	3	1	1	2	3	3	3	3	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	**Physiochemical properties of food and water** **a) Introduction to physiochemical properties of food** - Physical Properties of water and ice, hydrogen bonding, bound water, water activity, food stability determination of moisture content, acid-base balance **b) Types of colloidal system -** Colloids, sol, gel, emulsion and foam.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	**Chemistry of Starch and Sugar** **a) Starch-** Structure, characteristics, components and types, swelling of starch granules, gel formation, gelatinization, retrogradation, effect of sugar, acid, alkali, fat and surface-active agents on starch. **b) Sugar** - Stages of sugar, artificial sweeteners, solubility and crystallization, factors affecting crystallisation – crystalline and non-Crystalline candies, caramelization, chemistry of milk sugar, non-enzymatic browning and its preventive measures.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	**Chemistry of Protein** **a) Properties and components of protein -** Coagulation and denaturation of protein, protein concentrates, isolates and hydrolysate and their application, effect of soaking, fermentation and germination on pulse protein. **b) Chemistry of protein**-Action of heat, acid, and alkali on vegetable and animal protein.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	**Chemistry of Fats and oils** **a) Physical and chemical properties of fats and oils -** Hydrogenation, winterization, decomposition of triglycerides, shortening power of fats. **b) Changes in fats and oils**–Changes during cooking, factors affecting absorption of fat in foods.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	**Pigments, Food additives ,Leavening agents and Enzymes** **a) Pigments** - Types of plant pigments, water and fat soluble pigments, natural colours used in foods, pectins, phenolic components, enzymatic browning in fruits and vegetables. volatile compounds in fruits and vegetables. **b) Food additives**-Classification and its uses.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	c) **Leavening agents** - Types, physical, chemical and biological leavening agents, mechanism of action. **d) Enyzmes:** Classification and role of Enzymes in food industry			
VI	**SELF STUDY FOR ENRICHMENT** **(Not to be included for External Examination)** Water activity of any one perishable Natural sweetener Chemistry of coagulation of egg, Heat decomposition of fats Uses of Leavening agents.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Shakuntala Manay. N. (2013). *Foods: Facts and Principles*. (3rd ed.). New Age International Publishers, New Delhi.

2. Swaminathan, M. (2019). *Advanced Text Book on Food and Nutrition*. (2nd ed.). Bangalore Printing and Publishing Co. Ltd, Bangalore.

3. Srilakshmi.B.(2020). *Food Science*. (8th ed). New Age International Publishers, New Delhi.

4. Iqbal, Syed Aftab. (2011). *Advanced Food Chemistry*.Discovery Publishing House, New Delhi.

5. Chopra H,K and Panesar P,S. (2015). *Food Chemistry*. Narosa Publishing House(P) Ltd, New Delhi.

Reference Books

1. Vickie, A., Vaclavik Elizabeth, W.Christian. (2014). *Essentials of Food Science*.(4th ed.). Springer Science and Business Media, New York.

2. Raheena Begum, M. (2015). *Textbook of Foods. Nutrition and Dietetics*. (3rd ed.), Sterling Publishers Pvt. Ltd, New Delhi.

3. Avantina Sharm. (2019). *Textbook of Food Science and Technology*. (3rd ed.). CBS Publishers and Distributors.

Web Links

- https://www.sciencedirect.com/journal/food-
- https://www.eolss.net/sample-chapters/c10/e5-08-07-00.pdf
- http://egyankosh.ac.in//handle/123456789/69055

Journals

1. Journal of food chemistry and nutrition science, Pakistan.
2. Food chemistry, Elsevier, United Kingdom.

Pedagogy

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

Course Designer

Ms.S. FATHIMA
Ms.T. R. REVATHI

SEMESTER IV	INTERNAL MARKS: 40			EXTERNAL MARKS:60
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS / WEEK**	**CREDITS**
22UND4INT	**INTERNSHIP**	**INTERNSHIP**	**-**	**2**

Course Objectives

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

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 different functional areas in hospital	K1
CO2.	Explain work process followed in dietary department	K2
CO3.	Describe the management of human resources in dietary department	K2
CO4.	Prepare diet according to disease condition	K3
CO5.	Ascertain appropriate diet counselling methods	K4

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	2	3	3	2
CO2	3	3	3	2	3	3	2	3	3	2
CO3	3	3	3	2	3	3	2	3	3	2
CO4	3	3	3	2	3	3	2	3	3	2
CO5	3	3	3	2	3	3	2	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 multispecialty hospital for 15 days.
- Visits to different wards to observe patients requiring special diets.
- Experience in calculating and planning modified diets.
- Supervising and handling the food preparation and service in the dietary department of the hospital.
- Calculating the diet according to medical prescription.
- Accompanying the doctor while visiting the patient.
- Counsel the patient with different health condition.
- Case study- Selecting and observing 5 patients requiring a therapeutic diet in relation to Patient's dietary history - income, occupation, food habits and social factors.

Preparation of the report should include

- History of the hospital
- Facilities provided
- Organization structure
- Duties of the dietitian
- Layout of the dietary unit
- Dietary Department facilities
- Records
- Types of services
- Special dietary preparation
- Storage of food
- Handling of leftovers and shortages
- Sanitation and hygiene
- Case study

Text books

1. Shubhangini A Joshi. (2010). *Nutrition and Dietetics*. McGraw Hill Education Private Limited, New Delhi.

2. Anne Payne, Hellen Barker. (2010). *Advancing Dietetics and Clinical Nutrition*. Churchill Livingstone Elsevier, UK

3. Gopalan C, Rama Sastri B V and Balasubramaniyan S C. (2016). *Nutritive value of Indian Foods*. National Institute of Nutrition, Hyderabad.

Reference Books

1. Park. A. (2007). *Park's Textbook of Preventive and Social Medicine*. Bharat Publishers, Jabalpur.

2. C.R. Pennington. (2013). *Therapeutic Nutrition – A Practical Guide*. Springer, US.

Pedagogy:

E-content, Lecture, Seminar, Assignment, Demonstration

Course Designers

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

SEMESTER IV	INTERNAL MARKS: 25			EXTERNAL MARKS:75
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS / WEEK**	**CREDITS**
22UND4GEC2	**MEAL PLANNING FOR THE FAMILY**	**GENERIC ELECTIVE**	**2**	**2**

Course Objectives

- To understand the role of nutrition in different stages of life cycle.
- To gain experience in planning menu for different stages of life cycle.
- To develop skills in organizing and evaluating nutrition projects in the community.

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 inter relationship between health and nutrition	K1
CO2.	Explain menu planning principles and RDA for different stages of life cycle	K2
CO3.	Illustrate the importance of nutritional requirements and modified diet for various age groups and conditions	K2
CO4.	Predict nutritional problems throughout life cycle	K3
CO5.	Determine dietary principles in menu planning for various lifecycle and conditions	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	2	3	2	3	3
CO2	3	3	2	3	2	2	3	2	3	3
CO3	3	3	2	3	2	2	3	2	3	3
CO4	3	3	2	3	2	2	3	2	3	3
CO5	3	3	2	3	2	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	**Principles of Nutrition and Meal planning** Classification and functions of Nutrients. Define, malnutrition, over nutrition, under nutrition. RDA. Meal Planning – Definition, Objectives, Principles and Factors affecting Meal Planning. Food guide for selecting an adequate diet.	6	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4
II	**Nutrition for Pregnancy and Lactation** Pregnancy- Physiological changes, complications, food and nutritional requirements. Dietary guidelines. Lactation – role of hormones in milk production, food and nutritional requirements, advantages of breast feeding.	6	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4
III	**Nutrition for Infants and Pre-schoolers** Infant -Importance of breast milk, food and nutritional requirements, weaning and supplementary foods. Pre-schoolers - Food habits, food and nutritional requirements, points to be considered while planning a menu. nutritional problems.	6	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4
IV	**Nutrition for School going children and Adolescents** School going children - Food and Nutritional requirements, nutritional problems. Adolescents - Food and Nutritional requirements and eating disorders.	6	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4
V	**Nutrition during Adulthood and Old age** Adulthood - Reference man and Reference woman, Food and nutritional requirements. Old age - Nutritional requirements, nutritional problems and dietary management.	6	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4
VI	**SELF STUDY FOR ENRICHMENT** **(Not to be included for External Examination)** Basic Five Food Groups. Draw a sample Menu for pregnancy and lactation. Stunting and wasting. Pointed to be considered while planning a packed lunch. RDA for Adult belonging heavy worker.	-	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5

Text books

1. Srilakshmi B. (2017) *Nutrition Science*. 6th ed. New Age International Publishers, New Delhi.
2. Sumati R. Mudambi., Rajagopal M.V. (2021). Fundamentals *of Foods, Nutrition and Diet Therapy*. New Age International Publishers, New Delhi.
3. Swaminathan M. (2010). *Hand book of Food and Nutrition.* Bangalore printing and publishing co., Ltd, Bangalore.
4. Raheena Begum M. (2019). *A Text Book of Foods, Nutrition and Dietetics.* 3rd ed. Sterling publishers private Limited, New Delhi.

Reference Books

1. Gajalakshmi R. (2018). *Nutrition Science*. 2nd ed. CBS Publishers and distributors Pvt Ltd, New Delhi.
2. Indrani T K. (2005).Nursing Manual of Nutrition and Therapeutic Diet. Jaypee Brothers, Medical publishers (p) Ltd, New Delhi.
3. Khumud Khanna etal .(2020). Text book of Nutrition and Dietetics. 2nd ed.Elite Publishing House Pvt. Ltd New Delhi..

Web links

- https://www.ncbi.nlm.nih.gov/books/NBK209825/
- https://www.who.int/nutrition/topics/nutrecomm/en/

Journals

1. Nutrition, Elsevier Science Inc, United States.
2. Journal of Youth and Adolescence, Springer/Plenum Publishers, United States.
3. Journal of Food and Nutrition Research,Food Research Inst, Bratislava, Slovakia

Pedagogy: E-content, Lecture, Power point presentation, Seminar, Assignment, Quiz.

Course Designers

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

SEMESTER IV	INTERNAL MARKS: 40			EXTERNAL MARKS:60
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS / WEEK**	**CREDITS**
22UND4SEC1P	**BASICS IN FOOD PRODUCTION (P)**	**SKILL ENHANCEMENT**	**2**	**2**

Objectives

- To acquire knowledge on culinary skills in food production.
- To gain knowledge on preliminary techniques.
- To observe the various methods and techniques of cooking.

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 Basic Cooking methods and pre-preparations	K1
CO 2	Explain the uses of equipment in food production	K2
CO 3	Apply the practical skills and techniques used to prepare food	K3
CO 4	Infer the culinary skills in the preparation of food production	K4
CO 5	Determine the basic preparation of stock, soups, sauces and salads	K4

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	2	2	2
CO2	3	3	3	2	3	3	3	2	3	2
CO3	3	3	3	2	3	3	3	2	2	2
CO4	3	3	3	2	3	3	3	2	2	2
CO5	3	3	3	2	3	3	3	2	2	2

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

List of Experiments

1. Equipments – Identification, Description, Uses and handling.
2. Basic Cooking methods – Moist heat, dry heat and combination methods
3. Pre- preparation Techniques – Cutting techniques, paring, peeling, grating, grinding, sieving, steeping.
4. Stocks, Types of stock (Basic stock - Brown, white, fish, vegetable) Preparation of stock recipes.
5. Soups, Classification with examples, Basic recipes of Consommé Soup – Classification, Preparation and serving of Soups, common garnishes for soups.
6. Sauces - Basic Mother Sauces (Béchamel, Espagnole, Veloute, Hollandaise, Mayonnaise, Tomato Sauce) Preparation of sauce recipes.
7. Salad – Salads and its types, Salad dressings Salad Preparation (Potato Salad, Beetroot Salad, Green Salad, Fruit Salad, Lentil Salad).

Text Books

1. Krishna Arora.(2008). *Theory of cookery* Fronk Bros and Co. Publishers, New Delhi.
2. R. Singaravelavan.(2016). 2nd ed. *Food & Beverage Service.* Oxford University press. India.
3. Yogambal Ashokkumar.(2009).*Text book of Bakery and Confectionary* Prentice-hall of India Pvt. Ltd
4. V. Cessarani and R.Kinton 2002 *Practical Cookery* Hodder and Stoughton publishers

Reference Books

1. Krishna Arora, *Theory of Cookery*, 2008 Fran Brothers & Company (Pub) Pvt. Ltd.
2. Bali, Parvinder. (2013) *Quantity Food Production Operations and Indian Cuisine- S*.oxford, London
3. Aggarwal, D.K. (2006). *Kitchen Equipment & Design*, Aman Publications, New Delhi.
4. Vikas Singh, (2011) *Text Book of food Production (BTK),* Aman Pub., N. Delhi.
5. Parvinder S. Bali. (2014) *Food Production Operations*, 3rd Edition, Oxford University Press, New Delhi.
6. Philip, Thangam E. (2009) *Modern Cookery*, 5th Edition, Anna Salai, Chennai.

Web links

- https://bngkolkata.com/kitchen-equipment/
- https://www.chelseagreen.com/2023/fundamentals-stocks-broths/
- https://www.researchgate.net/publication/359336449_Chapter_no_2_Soups_21_Classification_of_Soups_with_5_examples_each_22_Consomm'eDefinition_Ingredients_Clarification_Recipe_for_one_ltr_five_variation_23_Garnishesh_Accompaniments_for_soup_Consomm'es
- https://hmhub.in/salads-salad-dressings/

Pedagogy

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

Course Designers

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