



Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University Estd. u/s 3 of UGC Act 1956, Category 'A' by MHRD)
Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC
Coimbatore - 641 043, Tamil Nadu, India

Department of Food Service Management and Dietetics
B.Sc. Food Service Management and Dietetics

Programme Outcomes

1. Attain and apply fundamental knowledge in basic concepts of science.
2. Gain competence to communicate effectively.
3. Develop critical thinking for innovations.
4. Identify problems and suggest appropriate scientific, technological and environmental solutions.
5. Function individually or as a team in work environment.
6. Acquire research skills to inquire, synthesize and articulate solution for community development.
7. Create and apply ICT tools for learning and technology development.
8. Exhibit professional ethics and norms for social development.
9. Implement acquired knowledge in basic sciences for self directed and lifelong learning.
10. Promote entrepreneurial skills.

Programme Specific Outcomes

1. Acquire knowledge on basic principles of dietetics and food service management.
2. Translate skills in recommending dietary principles and management of food service.
3. Develop competency to take up higher education, employment and entrepreneurship

Scheme of Instruction & Examinations
(For students admitted from 2023-2024 & onwards)

Part	Subject Code	Name of paper / Component	Hours of Instruction/ Week T+T/T+P	Scheme Examination				
				Duration of Exam	CIA	CE	Total	Credit
		First Semester						
Part I	23BLT001/ 23BLH001/ 23BLF001	பொதுத்தமிழ் தாள் I - இக்கால இலக்கியம் / Prose and Non Detailed Texts / French I	2	3	50	50	100	2
Part II	Ability Enhancement compulsory Course – I							
	23BAEEC1	English for Communication	4	3	50	50	100	4
	Generic Elective							
	23BFDGE1	Generic Elective - I	4+4	3	50	50	100	6
Part III	Discipline Specific Core Courses							
	23BFDC01	Basics of Food Science	4	3	50	50	100	4
	23BFDC01P	Basics of Food Science Practical	4	3	50	50	100	2
	23BFDC02	Principles of Nutrition	4	3	50	50	100	4
	23BFDC02P	Principles of Nutrition Practical	4	3	50	50	100	2
Part IV	Skill Enhancement Course							
	23BVBNC1/ 23BVBNS1/ 23BVBSP1	Value Based Course Elective I (NCC/NSS/Sports)	3/2	2	60	40	100	4/1/1
		Games	1		-	-	-	
							Total	28/25

Signature
5/2/2024

Part	Subject Code	Name of paper / Component	Hours of Instruction/ Week T+T/T+P	Scheme Examination				
				Duration of Exam	CIA	CE	Total	Credit
Second Semester								
Part I	23BLT002/ 23BLH002/ 23BLF002	பொதுத்தமிழ் தாள் II - அற இலக்கியம் / Grammar, Translation and General Essay / French II	2	3	50	50	100	2
Part II	Ability Enhancement compulsory Course – II							
	23BAEES1	Environmental Studies	4	3	50	50	100	4
	Generic Elective							
	Generic Elective - II							
	23BENGE2A/ 23BENGE2B/ 23BENGE2C/ 23BENGE2D	Introduction to Literature / British Literature / Modern Indian Literature / New Literatures in English	5+1	3	50	50	100	6
Part III	Discipline Specific Core Courses							
	23BFDC03	Meal Management	4	3	50	50	100	4
	23BFDC03P	Meal Management Practical	4	3	50	50	100	2
	23BFDC04	Operational Management in Food Service	4+4	3	50	50	100	6
Part IV	Skill Enhancement Course							
	23BVBNC2/ 23BVBNS2/ 23BVBSP2	Value Based Course Elective I (NCC/NSS/Sports)	3/2	2	60	40	100	4/1/1
	Professional Development Course							
	23BFDPD1	Professional Grooming	1	-	100	-	100	Remarks
		Games	1	-	-	-	-	
Total								28/25
Third Semester								
Part I	23BLT003/ 23BLH003/ 23BLF003	பொதுத்தமிழ் தாள் III - சமய இலக்கியம் / Ancient and Modern Poetry / French III	2	3	50	50	100	2
Part II	Generic Elective							
	Generic Elective - III							
			5+1/ 4+4	3	50	50	100	6
Part III	Discipline Specific Core Courses							
	23BFDC05	Basics of Quantity Food Production	4	3	50	50	100	4
	23BFDC05P	Basics of Quantity Food Production Practical	4	3	50	50	100	2
	23BFDC06	Basics of Human Physiology	4+4	3	50	50	100	6
Part IV	Skill Enhancement Courses							
	23BSBSC1	Skill Based Compulsory Course I Communication Skill	4P	3	50	50	100	2
		Skill Based Elective Course II	4P	3	50	50	100	2
	23BVBNC3/ 23BVBNS3/ 23BVBSP3	Value Based Course Elective I (NCC/NSS/Sports)	3/2	2	60	40	100	4/1/1
		Value Based Course Elective II	2	3	50	50	100	2
Total								30/27

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Part	Subject Code	Name of paper / Component	Hours of Instruction/ Week T+T/T+P	Scheme Examination				
				Duration of Exam	CIA	CE	Total	Credit
		Fourth Semester						
Part I	23BLT004/ 23BLH004/ 23BLF004	பொதுத்தமிழ் தாள் IV - சங்க இலக்கியம் / Introduction to Functional Hindi and Journalism / French IV	2	3	50	50	100	2
Part II	Generic Elective							
		Generic Elective - IV	5+1/ 4+4	3	50	50	100	6
Part III	Discipline Specific Core Courses							
	23BFDC07	Nutritional Biochemistry	4	3	50	50	100	4
	23BFDC07P	Nutritional Biochemistry Practical	4	3	50	50	100	2
	23BFDC08	Diet Therapy	4	3	50	50	100	4
	23BFDC08P	Diet Therapy Practical	4	3	50	50	100	2
Part IV	Skill Enhancement Courses							
	23BSBSS1	Skill Based Compulsory Course III Soft Skill	4P	3	50	50	100	2
		Skill Based Elective Course IV	4P	3	50	50	100	2
	23BVBNC4/ 23BVBNS4/ 23BVBSP4	Value Based Course Elective I (NCC/NSS/Sports)	3/2	2	60	40	100	4/1/1
		Value Based Course Elective III	2	3	50	50	100	2
*Catering Internship for four weeks during vacation								
							Total	30/27
		Fifth Semester						
Part III	Discipline Specific Core Courses							
	23BFDC09	Food Microbiology and Sanitation	4+4	3	50	50	100	6
	23BFDC10	Pediatric Dietetics	4	3	50	50	100	4
	23BFDC10P	Pediatric Dietetics Practical	4	3	50	50	100	2
	Discipline Specific Elective Courses							
	23BFDDE1-11	DSE I Theory + Practical / Theory + Tutorial	4+4/5+1	3	50	50	100	6
	23BFDDE12	DSE II* Internship	6	-	100	-	100	6
Part IV	Skill Enhancement Course							
	23BVBNC5/ 23BVBNS5/ 23BVBSP5	Value Based Course Elective I (NCC/NSS/Sports)	3/2	2	60	40	100	4/1/1
*Dietetics Internship for six weeks during fifth semester as DSE II								
							Total	28/25

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Part	Subject Code	Name of paper / Component	Hours of Instruction/ Week T+T/T+P	Scheme Examination				
				Duration of Exam	CIA	CE	Total	Credit
		Sixth Semester						
Part III	Discipline Specific Core Courses							
	23BFDC11	Management of Food Service	4+4	3	50	50	100	6
	23BFDC12	Entrepreneurship Development and Innovations	4+4	3	50	50	100	6
	Discipline Specific Elective Courses							
	23BFDDE1-11	DSE - III Theory + Practical / Theory + Tutorial	4+4/5+1	3	50	50	100	6
23BFDDE1-11	DSE - IV Theory + Practical / Theory + Tutorial	4+4/5+1	3	50	50	100	6	
Part IV	Skill Enhancement Courses							
	23BVBNC6/ 23BVBNS6/ 23BVBSP6	Value Based Course Elective I (NCC/NSS/Sports)	3/2	2	60	40	100	4/1/1
							Total	28/25
							Overall Total	172/154

➤ **Ability Enhancement Compulsory Courses**

- English for Communication
- Environmental Studies

➤ **Skill Enhancement courses**, are Skill Based and / or Value Based which are aimed at providing hands on training, competencies, skills etc. and may be opted by the students from the electives offered by the departments or from SWAYAM MOOCs / NPTEL

Skill Based courses

- **Skill Based Compulsory course I – 23BSBCS1 – Communication Skill** during 3rd semester
- **Skill Based Compulsory course III - 23BSBSS1 – Soft Skill** during 4th semester

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- **Skill Based Courses** offered by the Department of Food Service Management and Dietetics

S.No	Skill Based Elective Courses	Semester	Hours of Instruction	Credits/ Course
1	23BFDSE1- Culinary Skills	3 & 4	4P	2
2	23BFDSE2- Food Service Techniques			
3	23BFDSE3- Culinary Arts and Food Styling			

- **Value Based Courses - Elective I**

Value Based Courses Elective I	Subject Code	Semester	No of .Credits
NCC/ NSS/ Sports	23BVBNC1-6	1-6	24 Credits
	23BVBNS1-6		6 Credits
	23BVBSP1-6		6 Credits

- **Value Based Courses - Elective II/III** offered by Department of Food Service Management and Dietetics

Value Based Courses Elective II/III	Subject Code	Semester	Hours of Instruction	Credit / Course
1. Lifestyle Health	23BFDVB1	3 & 4	2 Hrs	2
2. Healthy Diets	23BFDVB2			

➤ **Discipline Specific Elective Courses** should be related to their own core which may be from SWAYAM MOOCs / NPTEL also

- All the courses have 6 credits with 4 hours of theory and 4 hours of practicals or 5 hours of theory and 1 hour of Tutorials.

S.No	Discipline Specific Elective Courses	Semester	Hours of Instruction	Credits
			Theory + Practical / Theory + Tutorial	
1.	23BFDDE1 Human Resource Management	5&6	5+1 hours	6
2.	23BFDDE2 Food and Beverage Services		4+4 hours	6
3.	23BFDDE3 Computer Applications in Food Service and Dietary Practices		4+4 hours	6
4.	23BFDDE4 Community Nutrition and Public Health		5+1 hours	6
5.	23BFDDE5 Fundamentals of Diabetes Counselling		5+1 hours	6
6.	23BFDDE6 Food Product Development and Packaging		4+4 hours	6
7.	23BFDDE7 Fitness Management		4+4 hours	6

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8.	23BFDDE8 Diet in Oncology	5&6	4+4 hours	6
9.	23BFDDE9 Bakery and Confectionery		4+4 hours	6
10.	23BFDDE10 Functional Foods		5+1 hours	6
11.	23BFDDE11 Food Adulteration and Quality Control		4+4 hours	6
12.	23BFDDE12 Internship	5	6 hours	6
SWAYAM MOOCs /NPTEL Courses can also be opted				

➤ **Generic Elective Courses** offered for other disciplines / departments

- A Core Course offered in a Discipline / Subject may be offered as a Generic Elective for other departments.

S.No	Generic Elective Courses	Semester	Hours of Instruction	Credits
			Theory + Practical / Theory + Tutorial	
1.	23BFDGE1 Perspectives of Home Science	1, 3, 4	4+4	6
2.	23BFDGE2 Introduction to Health and Diet Informatics		5+1	
3.	23BFDGE3 Adolescent Health		4+4	
4.	23BFDGE4 Indian Food Culture and Cuisines		4+4	

Total credits to earn the degree

1. Part I components - 8 Credits (Languages)
2. Part II components - 32 Credits (Ability Enhancement Compulsory Courses – 8 Credits, and Generic Elective Courses – 24 Credits)
3. Part III components - 96 Credits (Discipline Specific Core Courses – 72 Credits and Discipline Specific Elective Courses - 24 Credits)
4. Part IV components - Skill Enhancement Courses – 36 /18 Credits (Skill Based Courses-8, Value Based Courses Elective I (NCC/NSS/Sports) –24/6/6, Value Based Courses Elective II & III – 4)
5. **Minimum One Course should be from SWAYAM MOOCs/ NPTEL.**

One to 4 Courses may be from SWAYAM MOOCs/NPTEL for Credit Transfer in DSE, Generic Elective &/or Skill Enhancement Courses.

Signature

Basics of Food Science

Semester I
23BFDC01

Hours of instruction per week: 4
No. of credits: 4

Course Objectives:

1. Obtain knowledge of different food groups and their nutrient content.
2. Understand the scientific principle of food and apply it in food preparation.
3. Develop new food products ensuring food quality.

Hours

Unit I Introduction to Food science and cereal cookery

9

Food –Definition, classification of foods, basic Food groups, functions of food, Food Pyramid.

Methods of cooking-principle and need for cooking, Moist heat-boiling, simmering, poaching, stewing, blanching, steaming, pressure cooking dry heat-roasting grilling, toasting, baking, sautéing, Frying and Braising , their merits and demerits.

Cereals - Definition, types of cereals, Structure and nutritive value and processing of cereals-Wheat and Rice, effect of cooking-Gelatinization, gel formation, retro gradation, Syneresis and dextrinization. Use of cereals in Indian cookery- fermented, non fermented products and convenient cereal Foods.

Sugar and Sugar Products- different forms of sugar, stages of sugar cookery and its uses in cookery

Evaluation of food quality-Sensory evaluation-Subjective and Objective

Unit II Pulses, Vegetables and Fruits

12

Pulses-Nutritive value, processing of pulses-milling or decortications, soaking, germination, fermentation, parching, puffing and extrusion, toxic factors, anti nutritional factors in pulses. role of pulses in Indian cookery

Vegetables-Classification, nutritive value, pigments, selection, vegetable cookery-preliminary preparation, changes during cooking and loss of nutrients during cooking, effect of cooing on pigments

Fruits –Classification, Nutritive value, Pigments, Enzymatic browning, prevention of enzymatic browning, fruit cookery and role of fruits in Indian cookery.

Unit III Milk and Milk products and Eggs	17
Milk-Composition, nutritive value, different types of milk and milk products-fermented and non fermented milk products, methods of processing-clarification, pasteurization, homogenization and freezing. Role of milk in Indian cookery.	
Egg-Composition, nutritive value, evaluation of egg quality, effect of heat on egg cookery, role of egg in Indian cookery	
Unit IV Meat, Poultry and Fish	12
Meat-Classification, composition and nutritive value, post mortem changes, aging , tenderizing and curing. Cuts and grades of meat ,changes during cooking	
Poultry-classification, nutritive value, processing and preservation- canning, dehydration, chilling, freezing	
Fish-classification, nutritive value, selection, preservation –canning, chilling, smoking, salting, drying.	
Unit V Spices, nuts and oil seeds, Fats, food additives and food adulterants	10
Spices and condiments-Classification and uses of spices and condiments.	
Nuts and oil seeds- Processing and changes in Storage and cooking, fats and oils-types ,smoking temperature, absorption and factors affecting absorption of oil , role of fat in cookery	
Food Adulteration - Types and functions, common food adulterants, methods and measures to control adulteration	
Total Hours	60

Text Books:

1. **Srilakshmi, B (2018).** Food Science.8th Edition New Age International Limited, New Delhi.
2. **Rajagopal, M.V, Rao, S.M., Mudambi, S.R. (2013).** Food Science. Revised Second Edition. New Age International (P) Limited, New Delhi.
3. **Chandrasekhar, U (2002).** Food Science and Applications in Indian Cookery. Phoenix Publishing House Pvt ltd.

Reference Books:

1. **Parker, R (2016).** Introduction to Food Science. Delmer Publications, U.S.
2. **Potter.N. and Hotchkiss.J.H (1998).** Food Science.fifth edition. CBS publication and distributors Daryaganji, New Delhi.
3. **Freeland-Graves, J.H and Peckham, G.C. (1996).** Foundations of Food Preparation. Sixth Edition, Englewood Cliffs, N.J., Merill.

Websites:

1. <https://www.fda.gov>
2. <https://foodscience.ucdavis.edu>
3. <https://ncert.nic.in>

Course Outcomes:

1. Recollect the various food groups, their functions, nutrient composition and properties
2. Acquire knowledge on different methods of cooking and their characteristics.
3. Apply different processing skills on food and food products
4. Choose appropriate foods for menu planning and for development of food products.
5. Evaluate foods for quality standards and ensure food safety.

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	H	M	L	L	M	L	M	M	M	M	H	L	L
CO 2	H	M	L	L	M	L	M	M	M	M	H	M	L
CO 3	H	L	M	L	M	L	M	M	M	M	H	M	L
CO 4	H	M	L	L	M	L	M	M	M	M	H	M	L
CO 5	H	M	L	L	L	M	M	M	M	M	M	M	L

Basics of Food Science Practical

Semester I
23BFDC01P

Hours of instruction per week: 4
No. of credits: 2

Course Objectives:

1. Understand measurement of ingredients, and edible portion.
2. Learn different methods of cooking.
3. Gain knowledge on effect of cooking in different types of foods.

	Hours
Unit I Measuring Ingredients	10
Methods, determination of edible portion, effect of cooking on volume and weight. Sugar cookery-stages of sugar cookery, common desserts and confectionary- fondant, fudge	
Unit II Cereal cookery, pulse cookery	12
Methods of combining starch with water. Common method of cooking cereals, Gelatinization, gluten formation, fermented and Non fermented foods. Common methods of cooking pulses (soaked and un soaked), Common Recipes in cereals and millets	
Unit III Cooking of Vegetables and Fruits	16
Experimental cookery, methods of preventing darkening of fruits and vegetables, preparation of common recipes with fruits and vegetables.	
Unit IV Milk, egg, meat and poultry cookery	16
Experimental, common methods of cooking milk and milk products Common methods of cooking flesh foods (meat, poultry and fish)-Moist Heat and Dry Heat Common methods of cooking egg-Boiling, Poaching, frying and gravies	
Unit V Fats and oils,	6
Smoking temperature of different fats and oils, fat as medium for cooking –Shallow fat frying, Pan Frying, Deep fat Frying.	
Total Hours	60

Text Books:

1. **Srilakshmi, B (2018).** Food Science. 7th Edition, New Age International Limited, New Delhi
2. **Rajagopal, M.V., Rao, S.M., Mudambi, S.R. (2013).** Food Science. Revised Second Edition. New Age International (P) Limited, New Delhi.
3. **Chandrasekhar, U (2002).** Food Science and Applications in Indian Cookery. Phoenix Publishing House Private Limited.

Reference Books:

1. **Parker, R (2016).** Introduction to Food Science. Delmer Publications, U.S.
2. **Potter, N. and Hotchkiss, J.H (1998).** Food Science. Fifth edition. CBS publication and distributors Daryaganji, New Delhi.
3. **Freeland-Graves, J.H and Peckham, G.C. (1996).** Foundations of Food Preparation. Sixth Edition, Englewood Cliffs, N.J., Merill.

Websites:

1. <https://www.fda.gov>
2. <https://foodscience.ucdavis.edu>
3. <https://ncert.nic.in>

Course Outcomes:

1. Recollect various experimental procedure for basic cookery of different ingredients.
2. Determine edible portion of raw foods ,volume and weight of cooked foods .
3. Acquire skills on different methods of cooking.
4. Choose appropriate cooking methods to conserve nutrients.
5. Evaluate raw and cooked foods for quality standards

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	H	H	H	M	H	M	L	L	H	M	L	L	L
CO 2	H	H	L	L	L	L	M	M	H	L	L	M	L
CO 3	H	M	L	L	L	L	M	L	M	M	H	H	L
CO 4	H	M	M	L	M	H	L	L	H	M	H	M	L
CO 5	H	H	H	L	H	M	M	L	H	M	H	M	L

Principles of Nutrition

Semester I
23BFDC02

Hours of instruction per week: 4
No. of credits: 4

Course Objectives:

1. Understand the vital link between nutrition and health.
2. Gain knowledge on functions, sources and effects of macro and micronutrients.
3. Acquire skills on the requirements of nutrients.

	Hours
Unit I Nutritional status and Energy balance	12
The relation of good nutrition to normal physical development and sound health, Methods of assessing nutritional status – anthropometry, biochemical, clinical and diet survey. Definition of Caloric and Joule, Measurement of Calorific value of foods, basal metabolism, and specific dynamic action of foods, direct and indirect calorimetry.	
Unit II Carbohydrates, Proteins and Lipids	15
The proximate principles: classification, sources, functions, digestion, absorption, metabolism, requirements and effect of deficiency of carbohydrate, proteins and lipids, evaluation of protein quality.	
Unit II Minerals	12
Functions, sources, requirements, and deficiency diseases of calcium, phosphorus, magnesium, sodium, potassium, iron, copper, cobalt, zinc, iodine, manganese, fluorine, molybdenum, selenium and chromium.	
Unit IV Vitamins	12
History, classification, functions, sources, requirements and deficiency diseases of Vitamin A, Vitamin D, Vitamin E, Vitamin K, Ascorbic acid, Thiamine, Riboflavin, Niacin, Pyridoxine, Pantothenic acid, Folic acid and Cyanocobalamin.	
Unit V Water and Fibre	9
Importance of water balance. Fibre – definition, types, sources, functions of fibre.	
Total Hours	60

Text Books:

1. **Kalpna Bhardwaj (2011)**. Fundamentals of Diet and Nutrition. Ankit Publishing House Delhi.
2. **Frances Sizer and Ellie Whitney (2017)**. Nutrition concepts and controversies. International Student Edition. 14th Edition. Thomsos Learning Inc.
3. **Micheal J. Gibney, Lan A. Macdonald and Helen M. Roche (2011)**. Nutrition and Metabolism. 2nd Edition, Blackwell Publishing Company.

Reference Books:

1. **Mahan, L.K. and Stump, S.E (2019)**. Krause's Food, Nutrition and Diet Therapy. 14th Edition. W.B. Saunders Co.
2. **Marie Kainoa Fialkowski Revilla, Alan Titchenal, Jennifer Draper**, Human Nutrition – (2020), University of Hawai'i, Mānoa, ISBN 13: 9781948027014 , University of Hawaii Manoa, .
3. **Whitney, Cataldo and Rolfes (2011)**. Understanding Normal and Clinical Nutrition. 9th Edition, Wadsworth Thomson learning, USA.

Websites:

1. <https://www.ift.org/>
2. <https://link.springer.com/>
3. <https://www.mcgill.ca>

Course Outcomes:

1. Assess nutritional status of population groups and educate the importance of nutrients.
2. Comprehend the functions of macro and micronutrients with health and deficiency disorders
3. Identify symptoms of deficiency disorders.
4. Relate metabolism of macro and micronutrients with nutritional status of individuals and community.
5. Translate nutrient needs into dietary recommendation for individuals of different age groups considering cultural, religious and social diversification.

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	H	M	L	M	L	M	L	M	M	L	M	H	M
CO 2	H	M	M	M	M	L	M	L	M	M	M	H	M
CO 3	M	M	L	M	L	L	M	M	L	L	M	L	M
CO 4	M	H	M	H	M	M	M	M	L	M	M	H	M
CO 5	M	M	M	M	H	-	L	M	L	L	M	H	M

Principles of Nutrition Practical

Semester I
23BFDC02P

Hours of instruction per week: 4
No. of credits: 2

Course Objectives:

1. Gain competence in using various equipments for analysis.
2. Gain skills on qualitative analysis of macro and micronutrients.
3. Acquire skills on quantitative analysis of carbohydrates, vitamins and minerals.

	Hours
Unit I Carbohydrates Qualitative tests for Sugars- glucose, fructose, lactose, maltose, sucrose and Quantitative estimation of glucose	16
Unit II Proteins Qualitative tests for proteins	12
Unit III Lipids Demonstration of analysis of composition, body fat and lipid fractions.	12
Unit IV Minerals Qualitative tests for minerals, quantitative estimates of calcium, phosphorus and iron	12
Unit V Vitamins Quantitative estimation of ascorbic acid and cooking loss of ascorbic acid	8
Total Hours	60

Text Books:

1. **Kalpna Bhardwaj (2011)**. Fundamentals of Diet and Nutrition. Ankit Publishing House Delhi.
2. **Frances Sizer and Ellie Whitney (2017)**. Nutrition concepts and controversies. International Student Edition. 14th Edition. Thomsos Learning Inc.
3. **Whitman H. Jordan (2018)** ,(Principles of Human Nutrition: A Study in Practical Dietetics, Forgotten Books.

Reference Books:

1. **Joshi, S. A (2021)**. Nutrition and Dietetics, 5th Edition. Tata McGraw-Hill publishing Company Ltd, New Delhi.
2. **Mahan, L.K. and Stump, S.E (2019)**. Krause's Food, Nutrition and Diet Therapy. 14th Edition. W.B. Saunders Co.
3. **Whitney, Cataldo and Rolfes (2011)**. Understanding Normal and Clinical Nutrition. 9th Edition, Wadsworth Thomson learning, USA.

Websites:

1. www.healthline.com
2. www.webMD.com
3. www.medpub.com

Course Outcomes:

1. Gain knowledge on experimental procedures on analysis of nutrients
2. Acquire skills to handle laboratory equipments
3. Perform qualitative analysis of macro and micro nutrients
4. Carry out quantitative analysis of micro and macro nutrients
5. Interpret the analysed value of nutrient content for adequacy

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	M	M	L	L	M	L	L	L	L	L	M	L	H
CO 2	M	L	L	L	H	L	M	M	L	-	L	H	H
CO 3	H	M	M	M	H	M	M	M	L	L	M	L	H
CO 4	H	M	M	H	M	L	L	L	L	-	L	M	H
CO 5	M	M	M	H	M	L	-	M	L	-	L	M	H

Meal Management

Semester II

Hours of instruction per week: 4

23BFDC03

No. of Credits: 4

Course Objectives:

1. Acquire knowledge on the nutritional requirements for various age groups.
2. Comprehend the principles of planning diets for the age groups.
3. Develop skill to plan balanced diets for various stages of life.

	Hours
Unit I Introduction to Meal management	12
Classification of food groups, definition of balanced diet, food pyramid and its function, Recommended Dietary Allowances for different age groups, functions and factors influencing RDA. Meal planning-objectives, principles steps in menu planning and factors affecting meal planning.	
Unit II Nutrition in Pregnancy and Lactation	10
Physiological stages, nutritional requirements, food selection and menu planning for pregnant and lactating mother, complications of pregnancy.	
Unit III Nutrition during Infancy and Early Childhood	12
Growth and development during infancy, nutritional requirements, breast feeding and its advantages, infant formulae, introduction of supplementary foods. Growth and nutrient demands of preschool children, feeding practices and nutrition related problems, principles of meal planning for early childhood.	
Unit IV Nutrition for School Age children and Adolescents	12
Growth and nutrient needs, importance of healthy snacks, school lunch, food choices and factors influencing eating habits. Healthy eating practices and guidelines for meal planning for school children and adolescents.	
Unit V Adult and Geriatric Nutrition	14
Nutritional requirements and factors affecting them, healthy food choices and nutrition related problems.	
Factors affecting nutrient requirements, factors affecting food intake and choice of foods, nutrient needs, nutrition related problems among elderly.	
Total Hours	60

Text Books:

1. **National Institute of Nutrition (2020)**. Nutrient Requirements for Indians- Recommended Dietary Allowances and Estimated Average Allowances, Hyderabad.
2. **Drummond, K.E. and Brefere, L.M (2016)**. Nutrition for Food Service and Culinary Professionals. John Wiley and Sons, 9th Edition ,New York.
3. **Judith E Brown (2016)**. Nutrition Through Life Cycle , 6th edition, Wadsworth Publishing Co Inc .

Reference Books:

1. **National Institute of Nutrition (2020)**, Nutrient Requirements for Indians- Recommended Dietary Allowances and Estimated Average Allowances, Hyderabad.
2. **Joshi, S. A (2021)**. Nutrition and Dietetics. Tata McGraw-Hill publishing Company Ltd, 5th edition ,New Delhi
3. **Mahan, L.K. and Stump, S.E (2020)**. Krause's Food, Nutrition and Diet Therapy. W.B. Saunders Co, 15th edition.

Websites:

1. <https://www.food-management.com>
2. <https://eatrightindia.gov.in>
3. <https://www.akshayapatra.org>

Course Outcomes:

1. Plan a balanced meal for different age groups.
2. Plan meal in relation to physiological changes and nutritional requirements during pregnancy and lactation.
3. Suggest infant supplementary feeds and plan meals for preschool children.
4. Understand nutrient needs and demonstrate food choices for school going children and adolescents
5. Develop suitable menus for geriatric population.

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	H	M	H	M	M	L	L	M	H	M	M	M	M
CO 2	H	M	M	M	M	M	L	M	H	L	M	M	M
CO 3	H	H	M	M	H	M	L	H	H	M	M	H	M
CO 4	H	M	M	M	L	M	L	H	H	M	M	H	M
CO 5	H	H	M	M	H	M	L	M	H	H	M	M	M

Meal Management Practical

Semester II
23BFDC03P

Hours of instruction per week: 4

No. of Credits: 2

Course Objectives:

1. Plan and prepare a balanced diet for various age groups considering the Recommended Dietary Allowances and dietary guidelines.
2. Calculate the nutrient content of the diets.
3. Gain knowledge on apt food choices and nutrient conservative cooking techniques.

	Hours
Unit I Diet for an adult man and woman.	14
Planning, preparation and calculation of nutrient content of meals for high, middle and low income families and balanced diet for an adult man and woman doing different physical activities - sedentary, moderate, heavy.	
Unit II Menu planning for pregnant and lactating women.	12
Planning, preparation and calculation of nutrient content of a balanced diet for pregnant and lactating woman.	
Unit III Menu Designing for an infant and preschool child.	12
Preparation of weaning and supplementary foods, planning, preparation and calculation of nutrient content of meals for a pre- school child and for Protein Energy Malnutrition (PEM),.	
Unit IV Meal planning for school going child and adolescents.	10
Planning, preparation and calculation of nutrient content of meals/ packed lunch for school going children and planning a meal for adolescent anemic girls	
Unit V Menu for Elderly	12
Planning, preparation and calculation of nutrient content of diet for elderly with special focus on calcium deficiency	
Total Hours	60

Text Books:

1. **National Institute of Nutrition (2020).** Nutrient Requirements for Indians- Recommended Dietary Allowances and Estimated Average Allowances , Hyderabad.
2. **Drummond, K.E. and Brefere, L.M (2016).** Nutrition for foodService and Culinary Professionals. John Wiley and Sons, 9th Edition ,New York.
3. **Judith E Brown (2016).** Nutrition Through Life Cycle , 6th edition, Wadsworth Publishing Co Inc

Reference Books:

1. **National Institute of Nutrition (2020),** Nutrient Requirements for Indians- Recommended Dietary Allowances and Estimated Average Allowances , Hyderabad.
2. **Joshi,S. A (2021).** Nutrition and Dietetics. Tata McGraw-Hill publishing Company Ltd, 5th Edition ,New Delhi
3. **Mahan, L.K. and Stump, S.E (2020).** Krause's Food, Nutrition and Diet Therapy. W.B. Saunders Co, 15th Edition.
4. **Judith E Brown (2016).** .M a n u a l o f Clinical Nutrition Management, Compass Group, Inc.

Websites:

1. <https://www.fda.gov>
2. www.healthline.com
3. www.medpub.com

Course Outcomes:

1. Plan and prepare a balanced diet for various age groups.
2. Calculate the nutrients of the planned diet.
3. Formulate innovative supplementary feeds for different age groups.
4. Plan and prepare functional foods for nutrient deficiency
5. Suggest dietary guidelines for different age groups.

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	M	M	H	L	L	M	M	L	L	H	H	M	M
CO 2	M	M	H	L	M	M	M	L	L	H	H	M	M
CO 3	M	H	M	L	M	H	L	L	L	M	H	H	M
CO 4	H	M	M	L	M	H	M	M	L	H	H	H	M
CO 5	H	H	H	M	H	L	M	M	M	H	H	M	M

Operational Management in Food Service

Semester II
23BFDC04

Hours of instruction per week : 4+4

No. of Credits: 6

Course Objectives:

1. Understand the functions of front office, housekeeping, food and beverage departments
2. Gain knowledge on layout, space allocation and guest services.
3. Develop skills in operating equipments and handling operations

	Hours
Unit I Introduction to Food Service Operations and Front Office Management	12
Food Service Operations - objectives, commercial and non commercial food service, Front house and back house operations. Hotels – types, facilities and services Front Office Management - Functions of front office, organisation and staffing of Front office, Guest cycle Types of guest and key hotel terms, Modes and types of reservation, Basic reservation procedure/ activities, computerized reservation system, telephone communication and etiquette, check-in procedures for guest arrival and check-out procedures, modes of bill settlement.	12
Practical : Role play on front office functions - Reservations, Telephone Communications, Check in , Check out, Bill settlement	
Unit II House Keeping	12
Functions, organization and staffing of housekeeping department, functions of linen room, bed making. Types of cleaning equipments and cleaning agents. Types of fire accident, prevention and control. Safety and security measures, first aid and pest control.	
Practical : Role play on house keeping functions, market survey on cleaning agents and cleaning equipments, collection of different types of linen used in food service Demonstration of bed making, first aid, safety and security measures	12
Unit III Food Facility Layout	12
Principles of kitchen planning, types of kitchens, functional work areas and space relationship, working heights and flow of traffic. Storage area, pot and pan wash areas, types of fuel and fuel economy.	
Practical : Designing layouts of kitchen suitable for food service - commercial and non commercial Industrial visit to food production and Service units	12

Unit IV	12
Equipment	
Classification, factors affecting selection of equipment, features of equipment, designing, care and maintenance of electrical and non-electrical food service equipment, base materials, its strength and limitations, finishes, insulation materials.	12
Practical :	
Market survey of equipments, customized and modular equipments for Food Service Operations	
Equipments used at food service operations – commercial and non Commercial	
Unit V Professional ethics	12
Personal grooming, relationship of housekeeping and front office with other departments, modes of communication and etiquette, coordination with other departments,, handling guest complaints.	
Practical :	
Role Plays for handling guest complaints, Group Discussions - Importance of Relationship – Intra and Inter departmental coordination	12
Total Hours	120

Text Books:

1. **Andrews, S (2013).**Hotel Housekeeping Training Manual.Tata McGraw – McGraw Hill Publishing Co Ltd, New Delhi.
- 2.**James A. Bardi (2010).**Hotel front office management, 5th edition; John Wiley& Sons, Inc.
- 3..**Kinton, R., Cessarani, V. and Foskett, D (2009).**The Theory of Catering. Hodder and Stoughton.

Reference Books:

- 1.**K.S. Negi (2011),** A textbook of Hotel Management, wisdom Press.
- 2.**Michael , J. O Fallon and Denny G. Rutherford(2011).**Hotel Management and Operations, 5th edition, John Wiley and sons.
- 3.**Sethi, M (2011).**Institutional Food Management. Second edition .New age International (P) Limited.

Websites:

- 1.<https://www.ift.org>
- 2.<https://link.springer.com>
- 3.<https://www.mcgill.ca>

Course Outcomes:

1. Acquire knowledge and skills necessary to work in various departments of food service establishments.
2. Understand and obtain skills required to perform tasks in different functional areas of food Production areas.
3. Select and operate equipments, ensure safety measures at food service operations.
4. Imbibe professional ethics, qualities for front and back house operations.
5. Obtain skills in handling guests at different practical situations.

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	H	M	L	M	H	L	M	M	M	H	H	M	H
CO 2	H	M	L	M	H	L	M	M	M	H	H	M	H
CO 3	H	M	L	M	H	L	M	M	M	H	H	M	H
CO 4	H	M	L	M	H	L	M	M	M	H	H	M	H
CO 5	H	M	L	M	H	L	M	M	M	M	M	M	H

Professional Grooming

Semester II

Hours of instruction/week: 1

23BFDPD1

Objectives:

1. To impart knowledge on professional etiquette and grooming.
2. To develop communication and organizational skills.
3. To improve self-awareness and build confidence.

Content	Hours
Unit 1 Etiquette and manners Social etiquette, business etiquette, dining etiquette. Team work, conflict resolution. empathy	3
Unit 2 Confidence Building Self affirmations, positive attitude and mindset, emotional intelligence. Building rapport – effective networking, maintaining professional relation.	3
Unit 3 Oral and verbal communication skills Effective speaking, active listening, voice modulation, gesture and posture, eye contact Writing resume, official letters, preparing for interviews.	3
Unit 4 Time management and organizational skills Setting goals, scheduling of work, setting priorities, organizing resources, managing tasks and executing responsibilities	3
Unit 5 Personal hygiene and health Personal care, dressing, balance work life, stress reduction, general healthy life style.	3
Total Hours	15

Course Outcomes:

1. Acquire potential to groom themselves with confidence.
2. Make effective oral and verbal communication.
3. Ability to manage time and organize work.
4. Cultivate positive thinking and work towards goal achievement.
5. Actively contribute to team work and enhance problem solving skills.

Reference Books:

1. Gulati, S. (2019). Corporate Grooming and Etiquette, Audible Studios (Brilliance).
2. Bramara, S. (2022). The Art of Personal Grooming, Notion Press.
3. Bosquet, M.L.(2017). Personal Hygiene, Fb&c Limited.
4. Tracy, B. (2016). Master your Time Master your Life, Penguin Publishing Group.



Basics of Quantity Food Production

Semester III
23BFDC05

Hours of Instruction per week: 4
No. of credits: 4

Course Objectives:

1. Learn different food service systems.
2. Gain knowledge on production, planning, forecasting, purchasing and inventory control.
3. Understand stepping up of recipes and cost control.

	Hours
Unit I Introduction to Food Service Systems	10
Traditional, Commissary, Ready prepared – cook chill, cook freeze, assembly service.	
Unit II Production, Planning and Standardization of recipes	10
Production forecasting, planning, production scheduling, standardization of recipes, portion control, Stepping up of recipes of different cuisines	
Unit III Menu planning	12
Definition of menu, menu classifications, techniques of writing a menu, menu presentation, menu evaluation, purchasing procedures, procurement, product selection, specification, and method of purchasing - formal, informal, negotiated buying, cost plus purchasing, wholesale buying, blanket order purchasing, stockless purchasing, contract purchasing, auction buying, principles.	
Unit IV Receiving and Storage	12
Receiving – equipments in receiving area, invoice receiving procedure, steps in receiving process, receiving records. Storage – dry, refrigerator and freezer storage, layout, structural features. Inventory control and issuing – need, importance, types of inventory control.	
Unit V Quantity Food Production and service Management	16
Product standards, effective utilization of leftovers, waste disposal, Equipment for large scale production, holding and service, cost control, menu pricing.	
Total Hours	60

Text Books:

1. Sethi M. and Malhan S.M., Catering Management an Integrated approach (2015), 3rd edition, Published by New Age International Private Limited.
2. Parvinder S.Bali, Quantity Food Production Operations and Indian Cuisine (2011), published by Oxford University Press.
3. Palacio, J.P., Harger, V., Shugari, G. Thesis, M (2001). West and Wood's Introduction to Food Service. MacMillan Pub Co., New York.

Reference Books:

1. Thangam Philip (2005).Modern Cookery. Orient Longman Limited. Third edition.
2. Khan, M.A (2003).Food Service Operations. AVI Publications Co., Connecticut.
3. Cesarini, V.Kinton,R (2002).Practical Cookery.seventh edition. Hodder and Stoughton publishers.

Websites:

1. <https://www.fao.org>
2. <https://www.apeda.gov.in>
3. <https://www.ncbi.nlm.nih.gov>
4. <https://study.com>

Course Outcomes:

1. Comprehend food service systems.
2. Plan and forecast production schedules.
3. Select appropriate purchasing procedures and issuing.
4. Skill in stepping up recipes of different cuisines
5. Manage a large scale food production unit

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	M	H	H	H	M	M	M	H	H	H	H	H	H
CO 2	M	M	H	H	M	M	L	M	M	H	H	H	H
CO 3	M	M	H	L	M	L	M	M	M	H	M	M	H
CO 4	M	M	H	L	M	M	L	M	M	H	M	M	H
CO 5	M	M	H	H	M	M	L	H	H	H	H	M	H

Basics of Quantity Food Production Practical

Semester III
23BFDC05P

Hours of instruction per week: 4
No. of credits: 2

Course Objectives:

1. Gain skill on standardization of recipes.
2. Plan for large scale production of different cuisines.
3. Prepare different types of menus for events.

	Hours
Unit 1 Menu Planning and Preparation of basic soups, sauces, gravies and salads	
Plan menu for different types of food service institutions- commercial and non-commercial food service institutions.	10
Cuts of vegetables, basic stocks, soups- thin, thick and cream soup, sauces- white sauces, brown sauces, roux, veloute and béchamel. Types of gravies, thickening agents for gravies. Salads- main and accompaniment salads.	
Unit 2 Standardization of recipes	
Standardization of recipes of Indian cuisines – North, East, West, South regions	15
Standardization of recipes of Continental and oriental cuisines – French, Italian, Spanish, Mexican, Chinese, Thai and Japanese.	
Portion control techniques, Pricing.	
Unit III Indian Cuisine	
Stepping up of recipes for cuisine – State and Regional, Pricing and sales.	13
Unit IV Continental and Oriental Cuisines	
Stepping up of recipes for continental and oriental cuisines, pricing and sales.	13
Unit 5 Event Catering	
Preparation of menus for different formal and informal events. Role play on organization of banquets and buffets	9
Total Hours	60

Text Books:

1. **David Foskett, Patricia Paskins, Andrew Pennington, Neil Rippington (2021)**, Theory of Hospitality and Catering, 14th edition, published by Hachette UK.
2. **Sethi M. and Malhan S.M., Catering Management an Integrated approach (2015)**, 3rd edition, Published by New Age International Private Limited.
3. **June Payne-Palacio, Monica Theis, Introduction to Foodservice (2009)**, 11th illustrated, Published by Pearson/Prentice Hall.

Reference Books:

1. **Lea R. Dopson, David K. Hayes (2015)**, Food and Beverage cost control, 6th edition; John Wiley and Sons.
2. **John Cousins, Dennis, Lillcrap, Suzanne Weekes, Food and Beverage Service (2014)**, 9th edition, published by Hachette UK,.

3. Cesarani, V. Kinton, R (2002). Practical Cookery. seventh edition. Hodder and Stoughton publishers.

Websites:

1. <https://www.fao.org>
2. <https://www.apeda.gov.in>
3. <https://www.ncbi.nlm.nih.gov>
4. <https://study.com>

Course Outcomes:

1. Plan menus for food service institutions.
2. Standardize recipes for different cuisines at a large scale
3. Competent to prepare Indian and continental cuisines
4. Manage quantity food production, pricing and sale of the product.
5. Organize food production for different events.

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	H	M	L	L	H	L	L	M	M	H	H	H	H
CO 2	H	M	L	M	M	L	M	M	M	H	H	H	H
CO 3	H	M	L	L	H	L	L	M	M	H	H	H	H
CO 4	H	M	L	L	H	L	L	M	H	H	H	H	H
CO 5	H	M	L	L	H	L	M	H	H	H	H	M	H

Basics of Human Physiology

Semester III

Hours of instruction per week: 4+4

23BFDC06

No. of credits: 6

Course Objectives:

1. Understand the structure of various organs in the body.
2. Comprehend the functions of the various systems.
3. Interrelate the system functions in health.

	Hours
Unit I Blood and Circulatory system	
Composition and functions, plasma proteins, homeostasis, coagulation, Red Blood Corpuscles, White Blood Corpuscles, platelets, blood groups.	17
Structure of heart and blood vessels, properties of cardiac muscle, junctional tissues, cardiac cycle, heart rate, cardiac output, blood pressure and radial pulse	
Practical: Determination of bleeding time, clotting time, blood group, Estimation of haemoglobin level, Determination of heart rate and pulse rate, Recording of blood pressure, Recording of body temperature	20
Unit II Respiratory and Digestive	
Anatomy of respiratory tract, mechanics of respiration, transport of respiratory gasses in blood, gaseous exchange in lungs and tissues, regulation of respiration.	12
Anatomy of the digestive tract, liver and pancreas.	
Practical: Study of respiratory and digestive systems by preparing models, charts and videos.	10
Unit III Excretory system and Endocrine system	
Excretory system: Structure of kidney, nephrons, urine formation, composition of urine and micturition	15
Structure and functions of pituitary gland, Thyroid gland, parathyroid gland and adrenal gland and endocrine functions of pancreas.	
Practical: Study of excretory and endocrine systems by preparing models, charts and videos	10
Unit IV Nervous System	
Introduction to nervous system, Neuron structure and functions, Brain structure and functions, peripheral nervous system, sympathetic and parasympathetic nervous system.	8
Practical: Study of nervous system by preparing models, charts and videos	10

Unit V Reproductive System

Reproductive system: Anatomy of male and female reproductive organs, physiology of Menstruation, pregnancy and the associated changes, placenta, mammary gland and lactation.	8
Practical: Study of reproductive system by preparing models, charts and videos	10
Total Hours	120

Text Books:

1. **Sembulingam (2019)**. Essentials of Medical Physiology. Eighth Edition. Jaypee brothers Medical Publishers (P) Ltd, New Delhi
2. **Guyton and Hall (Arthur C. Guyton and John E. Hall) (2016)**, Functions of the Human Body., Thirteenth edition , Rebecca Grunion Publishing service, Philadelphia.
3. **Chatterjee Chandi Charan** .TextBook of Medical Physiology, London W.B.
4. **Best and Taylor (1992)**. The physiological basis for Medical pr actice. Saunders Company.

Reference Books:

1. **Indu Khurana (2014)**, Medical physiology, Second edition,. Reed Elsevier India Private limited.
2. **Robert F. Schmidt and Gerhard Thews (2013)**, Human Physiology, Springer Science & Business media.
3. **Lauralee Sherwood (2011)** ,Fundamentals of human physiology, Fourth edition Brooks Cole cengage learning.
4. **Waugh and Grant (2010)**. Ross and Wilson Anatomy and Physiology in health and illness. 11th edition. Elsevier.
5. **Ravi Kumar Patti, H. S..Makari, H.K. Gurumurthy H, Sowmiya S.V. (2009)** , A Textbook of human physiology” I. K. International publishing house Pvt., Limited
6. **Harbakhshsinghsandhar (2004)**, Textbook of Physiology, First edition, B. Jain publisher Pvt. Ltd,
7. **J.Tortora and Grabowski (2003)**. Principles of Anatomy and physiology. John Wiley and Sons.Inc.

Websites:

1. <https://www.hapsweb.org>
2. <https://www.physoc.org>
3. <https://www/iups.org>
4. <https://training.seer.cancer.gov>
5. <https://education.rajasthan.gov.in>

Course Outcomes:

1. Understand and distinguish the functions of organs in the body.
2. Comprehend the anatomy of the various organs.
3. Illustrate the processes of the respective system.
4. Get sensitized about the reproductive system and functions.
5. Elaborate the regulation of body fluids and blood parameters.

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	M	L	-	L	M	L	L	-	M	L	M	M	H
CO 2	M	M	-	L	M	L	L	-	M	L	M	M	H
CO 3	M	L	-	M	M	L	L	-	M	L	M	M	H
CO 4	L	L	-	L	M	L	L	L	M	M	M	L	M
CO 5	M	L	-	L	L	-	L	-	M	L	M	M	M

Nutritional Biochemistry

Semester IV
23BFDC07

Hours of instruction/week: 4
No. of credits: 4

Course Objectives:

1. Acquire knowledge on basic concepts of biochemical reactions
2. Understand the biochemical reactions involved in the metabolism of various nutrients in the body
3. Comprehend the mode of action of different hormones.

	Hours
Unit I Introduction to Biochemistry Definition of biochemistry. Biomolecules – Structure and major biomolecules. Enzymes - properties, classification and its functions. Molecular aspects of transport- passive diffusion, active transport, bioenergetics- role of ATP, biological oxidation, Electronic transport mechanism.	10
Unit II Carbohydrate metabolism Biomedical importance, glucose transport, glycolysis, metabolism of lactate and pyruvate, citric acid cycle, gluconeogenesis, glycogenesis, glycogenolysis, pentose phosphate pathway, release of energy during glucose oxidation in cells, oxidative phosphorylation.	11
Unit III Lipid metabolism Biomedical importance, intestinal resynthesis, transport, biosynthesis of fatty acids, mobilization, storage and metabolism of fat, beta oxidation of fatty acids, ketogenesis, ketosis, metabolism of phospholipids, glycolipids and cholesterol.	14
Unit IV Protein metabolism Biomedical importance, protein transport, transamination, deamination – fate of amino and keto groups, biochemical transformations, genetic repair mechanisms, genetic code – protein biosynthesis.	15
Unit 5 Hormones Pituitary, adrenocorticoid, thyroxin, insulin, glucagon, reproductive hormones, Mode of action, control of homeostasis.	10
Total Hours	60

Text Books:

1. Ambika Shanmugam (2016). Fundamentals of biochemistry for Medical student., Eighth edition. Wolters publication.
2. Lehninger. Michael M.Cox, David L.Nelson (2008). Principles of Biochemistry. Fifth edition. W.H. Freeman and Company, New York.
3. Rodney Boyer (2006). Concepts in Biochemistry. Third edition. John Wiley and Sons (Asia) Pvt.Ltd.

Reference Books:

1. Jeremy N. Berg, John L.Tymoczko, and Lnbert Stryer (2007). Biochemistry. Sixth edition. W.H. Freeman and Company.
2. Robert K. Alurray, Daryl K.Granner and Victor W.Rodwell (2007). Harper's Illustrated Biochemistry. 27th edition. McGraw-Hill Companies, Inc.

3. Thomas M. Devin (2006). Textbook of Biochemistry with Clinical Correlations. Sixth edition. Miley-Liss, Hocke, NJ.

Websites:

1. <https://themedicalbiochemistrypage.org/>
2. <https://www.biochemistry.org/>
3. <https://www.science.gov/>

Course Outcomes:

1. Understand the basic concepts of biochemistry
2. Gain knowledge on metabolism of carbohydrate protein and lipids
3. Acquire knowledge on functions and mode of action of different hormones.
4. Relate metabolism of different nutrients with dietary intake.
5. Suggest preventive measures to overcome metabolic abnormalities.

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	H	L	L	L	L	L	M	L	L	L	H	L	L
CO 2	M	L	L	L	L	L	M	L	L	L	M	M	L
CO 3	M	L	L	M	L	L	M	L	L	L	M	M	L
CO 4	H	M	M	M	H	M	M	M	M	M	H	H	H
CO 5	H	M	H	H	M	H	M	M	H	M	H	H	H

Nutritional Biochemistry Practical

Semester IV
23BFDCO7P

Hours of instruction/week: 4

No. of credits: 2

Course Objectives:

1. Learn the collection of blood and urine samples for analysis.
2. Develop skill in handling analytical equipments.
3. Understand standard procedures for analysing urine and blood sample.

	Hours
Unit I Introduction to lab techniques. Qualitative analysis of sugars in urine.	12
Unit II Qualitative analysis of urea, creatinine and nitrogen in urine sample.	16
Unit III Methods of collection of blood. Separation of serum and plasma. Quantitative estimation of blood for glucose	8
Unit IV Quantitative estimation of blood cholesterol, iron and haemoglobin	12
Unit V Quantitative estimation of urea, creatinine and protein in blood	12
Total	60

Text Books:

1. Ochei J. and A. Kolhatkar. (2019). Medical laboratory science theory and practice, Seventeenth Edition, Tata MC Graw Hill publication.
2. Ramnik Sood. (2015). Concise Book of Medical Laboratory technology, Second Edition, Jaypee Brothers Medical publishers Pvt. Ltd.
3. Ramakrishnan S, Sulochana K.N, Shankara S, M.K Ganesh, A Hemavathi. (2012). Laboratory Manual for practical Biochemistry, First Edition, Jaypee Brothers Medical publishers Pvt. Ltd.

Reference Books:

1. Jeremy N. Berg, John L.Tymoczko, and Lubert Stryer (2011). Biochemistry. 7th edition, W.H. Freeman and Company.
2. Thomas M. Devin (2010). Textbook of Biochemistry with Clinical Correlations. 6th edition. Miley-Liss, Hocke, NJ.
3. Robert K. Alurray, Daryl K.Granner and Victor W.Rodwell (2007). Harper's Illustrated Biochemistry. 27th edition. McGraw-Hill Companies, Inc.

Website:

1. www.aoac.org
2. <https://www.nist.gov>

Course Outcomes:

1. Skillfull in collection of blood and urine samples for analysis.
2. Competent in handling analytical equipments.
3. Choose appropriate analytical procedures.
4. Perform quantitative and qualitative analysis of urine and blood sample.
5. Examine and interpret analytical results.

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	L	L	L	L	H	L	L	H	L	M	L	L	M
CO 2	M	M	M	L	H	M	M	H	M	M	M	L	H
CO 3	H	L	M	H	L	H	M	H	H	M	M	M	H
CO 4	M	M	L	M	H	M	M	H	M	M	M	M	H
CO 5	H	M	M	H	H	M	M	H	M	M	M	H	H

Diet Therapy

Semester IV
23BFDC08

Hours of instruction per week: 4
No. of credits: 4

Course Objectives:

1. Understand the role of a dietitian.
2. Gain knowledge on the principles of diet therapy and different therapeutic diets.
3. Develop skills to plan and prepare therapeutic diets.

	Hours
Unit I Concept of Diet Therapy, Parenteral and Enteral nutrition	12
<p>Role and responsibilities of dietitian, therapeutic adoption of normal diet, assessment of patient's needs. Principles and classification of therapeutic diets- routine hospital diet soft diet, clear liquid ,full fluid diet and blenderised diets. Enteral and parenteral nutrition-types of tube feeds and TPN formulas, complications of enteral and parenteral feeding practices.</p>	
Unit II Febrile conditions, obesity and overweight	10
<p>Etiology and dietary management in acute, chronic and recurrent fevers. Etiology, assessment, classification, dietary management and complications of obesity and underweight. Role of nutraceuticals in dietary management of diseases.</p>	
Unit III GI tract, liver diseases and diet in diabetes mellitus	16
<p>Etiology, symptoms, biomarkers and dietary management in gastritis, peptic ulcer, diarrhea and constipation. Functions of liver, etiology, symptoms, biomarkers of liver diseases, dietary management of liver diseases-hepatitis, cirrhosis, cholecystitis, cholelithiasis , pancreatitis . Etiology ,symptoms ,biomarkers , types and dietary management of diabetes mellitus and its complications</p>	
Unit IV Cardiovascular and renal diseases	12
<p>Causes, types, symptoms, biomarkers and dietary management of cardiovascular diseases - hypertension, hyperlipidemia, atherosclerosis and renal diseases- acute, chronic, glomerulonephritis, nephrosis, nephritic syndrome, nephrolithiasis, renal failure , dialysis, Kidney transplantation</p>	
Unit V Allergic condition, Cancer and Gout	10
<p>Causes, types, symptoms biomarkers and dietary management of food allergy-food sensitivity, lactose intolerance , cancer and gout</p>	
Total Hours	60

Text Books:

1. **James, W.P.T. and Ralph, A (2020).** Human Nutrition and Dietetics. Tenth edition Churchill Livingston.
2. **Srilakshmi (2019).** Dietetics. New Age International Private Limited.
3. **Metta J.S. (2014).** Basic Nutrition Management. Aavishkar publishers .Mumbai.

Reference Books:

1. **Mahan, L.K. and Stump, S.E (2020).** Krause's Food, Nutrition and Diet Therapy. fifteenth Edition. W.B.Saunders Co.
2. **Lori and ASmolin(2016).** Nutrition Science and Applications. Fourth edition. Saunders College publisher. New Delhi
3. **Air Cmde.L.K.Sharma (2012),** Nutrition Dietician and Health Management, 1st edition,.Published by Surendra Publications

Websites:

1. <https://www.fda.gov>
2. <https://journals.sagepub.com>
3. www.ida.com
4. <https://lod.nal.usda.gov>
5. <https://www.nutrition.gov>

Course Outcomes:

1. Relate the causes, symptoms and onset of various types of diseases.
2. Comprehend dietary principles in planning therapeutic diets for disease conditions.
3. Acquire professional diet counseling skills.
4. Manage a dietary department at the capacity of a dietitian.
5. Become a healthcare professional.

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	H	M	M	M	H	L	M	M	H	M	H	M	M
CO 2	H	M	M	M	H	L	M	H	H	M	H	M	M
CO 3	H	H	M	M	M	L	M	M	H	M	H	H	M
CO 4	H	H	M	M	H	L	M	H	H	M	H	H	M
CO 5	H	M	M	M	H	L	M	H	H	M	H	H	M

Diet Therapy Practical

Semester IV
23BFDC08P

Hours of instruction per week: 4
No. of credits: 2

Course Objectives:

1. Understand the dietary principles to plan therapeutic diets for disease conditions.
2. Plan and calculate the nutrient content of the diets prepared.
3. Acquire skills in diet counselling.

	Hours
Unit I Routine Hospital diets, soft and liquid diet	12
Normal diet, hospital diet- clear fluid, full fluid and soft diet, pre and post-operative diets.	
Unit II Febrile conditions, High and low calorie diets	12
Diet in typhoid, malaria, tuberculosis, obesity and underweight.	
Unit III Gastrointestinal and liver diseases	12
Diet in diarrhea, constipation, peptic ulcer, gastritis, hepatitis, cirrhosis, gallstones and pancreatitis.	
Unit IV Cardiovascular diseases and diabetes mellitus	12
Mild, moderate and severe sodium restricted diet, diet in atherosclerosis, diabetes mellitus -type I, type II and gestational diabetes mellitus.	
Unit V Renal diseases	12
Diet in nephritis, nephrosis, nephrolithiasis, acute and chronic renal failure.	
Diet in allergy, cancer and gout. Demonstrate the available software related dietary management of diseases.	
Total Hours	60

Text Books:

1. **James, W.P.T. and Ralph, A (2020).** Human Nutrition and Dietetics. Tenth edition Churchill Livingstone.
2. **Srilakshmi (2019).** Dietetics. New Age International Private Limited.
3. **Metta J.S. (2014).** Basic Nutrition Management. Aavishkar publishers .Mumbai.

Reference Books:

1. **Mahan, L.K. and Stump, S.E (2020).** Krause's Food, Nutrition and Diet Therapy. fifteenth Edition. W.B.Saunders Co.
2. **Meenakshi Bajaj (2019)** Diet Metric , Handbook of Food Exchange , First edition, Notion press publication, Chennai.
3. **Lori and ASmolin(2016).** Nutrition Science and Applications. Fourth edition. Saunders College publisher. New Delhi

Websites:

1. <https://www.nqr.gov.in>
2. <https://www.mofpi.gov.in>
3. <https://nios.ac.in>

Course Outcomes:

1. Relate the causes, symptoms and onset of various types of diseases.
2. Apply dietary principles to plan therapeutic diets for diseases conditions
3. Demonstrate skills in preparing appropriate therapeutic diets and calculate the nutrient content of diets prepared.
4. Counsel and recommend personalized diets for various disease condition
5. Become a healthcare professional.

CO /PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO 1	H	M	L	L	H	M	M	H	H	M	H	H	M	M
CO 2	H	M	L	L	H	M	M	H	H	M	H	H	M	M
CO 3	H	H	L	M	H	M	H	H	H	H	M	M	M	M
CO 4	H	M	M	M	H	M	M	H	M	H	H	H	H	M
CO 5	H	M	M	M	H	H	M	H	M	H	M	M	M	M

Ability Enhancement Compulsory Course
Applicable for Undergraduate students admitted from the academic year
2023-2024 & onwards
Environmental Studies

Semester II
23BAEES1

Hours of Instruction per week: 4
No. of Credits: 4

Hours

Unit I Introduction to Environmental studies and Ecosystems

10

Multidisciplinary nature of environmental studies; components of environment - atmosphere, hydrosphere, lithosphere and biosphere.

Scope and importance; Concept of sustainability and sustainable development.

What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chain, food web and ecological succession. Case studies of the following ecosystems

- a) Forest ecosystem
- b) Grassland ecosystem
- c) Dessert ecosystem
- d) Aquatic ecosystems (ponds, stream, lakes, rivers, oceans, estuaries)

Unit II Natural Resources: Renewable and Non-renewable resources

10

Land resources and land use change; land degradation, soil erosion and desertification.

Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.

Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter state).

Heating of earth and circulation of air, air mass formation and precipitation.

Energy resources: Renewable and Non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Unit III Biodiversity and Conservation

10

Levels of biological diversity: genetic, species and ecosystem diversity; Biogeography Zones of India; Biodiversity patterns and global biodiversity hot spots.

India as a mega-biodiversity nation; Endangered and endemic species of India.

Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions, conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

Unit IV Environmental Pollution, Policies & Practices**10**

Environmental pollution: types, causes, effects and controls; Air, Water, Soil, chemical and noise Pollution.

Nuclear hazards and human health risks

Solid waste management: Control measures of urban and industrial waste.

Pollution case studies.

Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.

Environmental Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention & Control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act; International Agreements; Montreal and kyoto protocols and conservation on Biological Diversity (CBD). The Chemical Weapons Convention (CWC).

Nature reserves, tribal population and rights, and human, wildlife conflicts in Indian context.

Unit V Human Communities and the Environment**10**

Human population and growth: Impacts on environment, human health and welfares.

Carbon foot-print.

Resettlement and rehabilitation of project affected persons; case studies.

Disaster management: floods, earthquakes, cyclones and landslides,

Environmental Movements: Chipko, Silent Valley, Bishnios of Rajasthan.

Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.

Environmental Communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

Field Work**10**

Visit to an area to document environmental assets; river/forest/flora/fauna, etc.

Visit to local polluted site- Urban/Rural/ Industrial/Agricultural.

Study of common plants, insects, birds and basic principles of identification.

Study of simple ecosystems- pond, river, Delhi Ridge, etc.

Total Hours 60**Reference Books:**

1. **Singh, J.S, Singh, S.P. & Gupta, S.R. (2014).** Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.
2. **Grumbine, R. Edward, and Pandit, M.K. (2013).** Threat's from India's Himalayadams. Science, 339:36-37.
3. **Sodhi, N.S., Gibson, L.& Raven, P.H.(eds). (2013).** Conservation Biology: Voices from the Tropibcs. John Wiley & Sons.
4. **Raven, P.H., Hassenzahl, D.M & Barg, L.R (2012).** Environment. 8th edition. India.
5. **Pepper, I.L., Gerba, C.P. & Brusseau, M.L.(2011).** Environmental and Pollution Science.Academic press.
6. **Wilson, E.O. (2006).** The Creation: An appeal to save life on Earth. New York: Norton.

7. **Groom, Martha J. Gary K. Meffe, and Carl Ronald Carroll (2006).** Principles of Conservation Biology. Sunderland: Sinauer Associates,
8. **Sengupta, R.(2003).** Ecology and Economics: An approach to sustainable development. OUP.
9. **Carson, R. (2002).** Silent Spring, Houghton Mifflin Harcourt.
10. **Rosencranz, A., Divan, S., & Noble, M.L. (2001).** Environmental Law and Policy in India.
11. **McNeil, John R. (2000).** Something new under the Sun: An Environmental History of the 20th Century.
12. **Gleeson, B. nad Low, N.(1999).** Global Ethics and Environment, London, Routledge.
13. **Rao, M.N. & Datta, A.K. (1998).** Waste Water Treatment. Oxford & IDH publishing Co. Pvt.Ltd.
14. **Thapar, V.(1998).** Land of the Tiger: A Natural History of the Indian Subcontinent.
15. **McCully, P.(1996).** Rivers no more: the environmental effect of dams (pp.29-64). Zed books.
16. **Gadgil, M.,& Guha, R.(1993).** This Fissured Land: An Ecological History of India. Univ. of California Press.
17. **Gleick, P.H. (1993).** Water in Crisis. Pacific Institute for studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
18. **Odum, E.P., Odum, h,T. & Andrews, J.(1971).** Fundamentals of Ecology. Philadelphia: Saunders.
19. **Warren, C.E.(1971).** Biology and Water Pollution Control. WB Saunders.

Websites:

1. www.nacwc.nic.in
2. www.opcw.org

Food Microbiology and Sanitation

Semester V
23BFDC09

Hours of instruction per week : 4+4
No. of Credits: 6

Course Objectives:

1. Understand the role and types of microorganisms in food and environment.
2. Gain knowledge on the various types of food spoilage and prevention.
3. Provide a basic understanding of quality concepts and practice and different laws pertaining to food safety and security.

Unit I Fundamentals of Microbiology

20

Introduction, development of microbiology, different microorganisms and their morphological characteristics (Bacteria, Yeast, Mold, Virus), Benefits of Microorganisms. Contamination of food spread of diseases through water, air and soil.

Related Experience: Microscopic examination of different microbes in food and Identification of food born diseases through contamination of food.

40

Unit II Food Microbiology

Milk and milk products- kinds of microorganism, source of contamination, tests to determine microbial quality and techniques of pasteurization
Cereal and cereal products – microorganisms associated with the spoilage of cereals, control of microorganism in bread and cereal products
Fruits and vegetables –contamination, spoilage, control of microorganisms and preservation of fruits and vegetables.
Meat, poultry, fish and eggs-contamination, spoilage and control of microorganism.

Related Experience: Identification of spoilage of bread, milk vegetables, fruits and meat, poultry, fish and eggs.

20

Unit III Food safety

Definition, types of hazard-physical, chemical and biological, factors affecting food safety. Safety in food procurement, hygienic practices in handling and serving foods. Standard Operation Procedure (SOP). Major quality control functions.

Related Experience: Identification of hazards in foods

20

Unit IV Control of microorganisms

Contamination and sanitary quality of water, Testing the quality of water and

purification of water. Role of sterilization and disinfection to control microorganisms.
Air microbiology – contamination and control measures.

Related Experience: Identification of bacteria in water and air.

20

Unit V Food laws and standards

Food Safety and Standard Authority of India (FSSAI) regulations for various foods.
HACCP.

Case Study: Observing HACCP Principles in Industrial Case studies

Total Hours

120

Text Books:

1. **Frazier WC, Westhoff DC, Vanitha, N.M.** (2017). Food Microbiology. 5th ed. McGraw Hill Education.
2. **Pelczar MJ, Chan ECS, Krieg N.** (1993) Microbiology. 5th ed. Tata McGraw-Hill Publishing Co. Ltd.
3. **Ananthanarayan, R., Paniker, C.K.J., Kanungo, R. and Saxena, S.** (2022). Textbook of Microbiology”, Universities Press (India) Pvt. Ltd.

Reference Books:

1. **Jeffery C. Pommerville** (2017), Fundamentals of Microbiology, Eleventh edition V P. Executive Publishers.
2. **Martin R. Adams, Maurice O Moss, Peter** (2016). Food Microbiology, Fourth edition, Royal society of chemistry.
3. **Bibek Ray, ArunBhunia** (2014), Fundamentals of food microbiology, Fifth edition Taylor & francis group, LLC

Websites:

1. <https://www.fssai.gov.in/>
2. <https://www.fda.gov/food/guidance-regulation-food-and-dietary-supplements>
3. <https://www.ifsh.iit.edu>
4. <https://www.foodsafety.gov>

Course Outcomes:

1. Acquire the knowledge on the basic concepts of microbes in food and human welfare.
2. Relate theoretical knowledge with microbes in the environment.
3. Comprehend the knowledge gained on the characteristics of the microorganism in food and apply the techniques to control microbes.
4. Understand the relevance of microbial spoilage of various foods and its toxic effects.
5. Suggest frame work on the concepts of Quality Control Activities.

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	M	L	L	L	L	H	M	M	L	L	H	L	L
CO 2	M	-	M	M	L	H	M	M	L	L	M	M	L
CO 3	H	L	M	M	H	M	M	H	M	H	M	M	M
CO 4	H	L	H	M	M	H	M	M	L	H	H	M	M
CO 5	H	-	H	M	M	M	H	L	H	M	M	H	H

Pediatric Dietetics

Semester V
23BFDC10

Hours of instruction per week: 4
No. of credits: 4

Course Objectives:

1. Learn the pattern of growth and development during childhood.
2. Understand the nutritional needs of children.
3. Gain knowledge on the principles of diet therapy for childhood diseases.

	Hours
Unit I Fetal Development and Growth of Infants	12
<p>Maternal reproductive health, conception and formation of fetus, stages of fetal growth, role of placenta and hormones, physiological development of neonates and infants. Introduction to weaning and complementary foods, Importance of weaning, factors to be considered while weaning process, low cost nutritious supplementary foods do's and don'ts during weaning. Nutritional requirements of infants, preschoolers, school age.</p>	
Unit II Diet in Low Birth Weight Infants and Nutritional Disorders	12
<p>Requirements of Low-birth weight infants, Basics of Parenteral feeding, transition from parenteral to enteral feeding, feeding formula and feeding methods, Diet in common communicable diseases. PEM, vitamin A deficiency, anemia, dental caries.</p>	
Unit III Diet in Endocrine and Gastrointestinal Disorders and Food Allergies	15
<p>Childhood obesity- etiology, risk, dietary interventions and weight management. Type I diabetes- etiology, insulin therapy and nutritional management. Causes, dietary management in jaundice, diarrhea and constipation and ORT. Food allergens, sensitivity to breast milk, cow milk allergy and elimination diets.</p>	
Unit IV Diet in Inborn Errors of Metabolism, Cancer and Wasting Diseases	11
<p>Lactose intolerance-causes, symptoms and diet management, milk substitutes, inborn errors of protein - phenylketonuria, homocystinuria, maple syrup urine disease. Carbohydrate - glycogen storage disease, fructose intolerance and fat metabolism- FAOD causes, symptoms and dietary management. Diet in degenerative diseases - congenital heart disease, types of cancers – leukemia, tumor, dietary recommendations and preventing malnutrition, HIV transmission to children, symptoms, care of HIV infected children and dietary intervention. Cost of childhood morbidity and mortality.</p>	
Unit V Child Feeding Psychology	10
<p>Introduction to child psychology, importance of child psychology, feeding problems, psychological guidance, counseling parents for feeding strategies.</p>	
Total Hours	60

Text Books:

1. **Lanigan J, Singhan A. (2009)** Early Nutrition and Long-Term Health : a Practical approach. Proceeding of the Nutrition Society.
2. **Robinson C.R. and Lawler M (2004)**. Normal and Therapeutic Nutrition. Macmillan Publishers and Co., New York.
3. **Antia F.P (2002)**. Clinical Dietetics and Nutrition. Oxford University Press, New Delhi.

Reference Books:

1. **Joshi. S.A (2010)**. Nutrition and Dietetics. Third edition.
2. **Mahan, K and Stump S.E (2008)**. Krause's Food and Nutrition Therapy. eleventh edition, Saunders Publishing Company.
3. **ICMR (2008)**. Nutrient Requirements and Recommended Dietary Allowances for Indians, New Delhi.

Websites:

1. <https://www.nutrition.gov>
2. <https://www.nal.usda.gov>
3. <https://nhm.gov.in>

Course Outcomes:

1. Comprehend the importance and principles of dietetics for infants and children.
2. Plan suitable diets for nutritional disorders.
3. Apply diet therapy for diabetes and congenital heart diseases.
4. Evaluate feeding problems and counsel.
5. Create new feeds for children.

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	M	H	H	H	H	H	M	M	M	M	H	H	M
CO 2	H	H	H	H	H	M	M	M	H	M	H	H	M
CO 3	H	H	H	M	M	M	M	M	H	M	H	M	M
CO 4	H	H	M	H	H	M	M	M	H	M	H	M	M
CO 5	M	M	H	H	H	M	M	M	M	M	M	M	M

Pediatric Dietetics Practical

Semester V
23BFDC10P

Hours of instruction per week: 4
No. of credits: 2

Course Objectives:

1. Relate dietary principles with nutritional requirements for children.
2. Prepare weaning foods suitable for children.
3. Plan diet for common diseases for the prevention of childhood diseases.

	Hours
Unit I Weaning and feeding formulae	12
Plan diets for different types of weaning foods –Liquid foods, Semi-solid foods, Solid foods, Low cost nutritious supplementary foods. Demonstration of feeding techniques adopted for normal and special children.	
Unit II Febrile condition	12
Planning and preparation of diets for children suffering from febrile conditions, common cold and chicken pox/ measles/mumps, and polio.	
Unit III Gastrointestinal disorders	12
Diet for Gastrointestinal Diseases- Jaundice, diarrhea, vomiting & constipation and fluid diets.	
Unit IV Nutritional disorders	12
Diets for childhood obesity, (Type 1 diabetes), children suffering from PEM, vitamin A deficiency, anemia and dental caries	
Unit V Inborn errors and Wasting Diseases	12
Diets for children suffering from lactose intolerance, inborn errors of metabolism – phenylketonuria, autism, lactosemia, leukemia & HIV infected children. Hospital visit to observe the preparation and administration of feeding modalities	
Total Hours	60

Text Books:

1. Lanigan J, Singhal A. (2009), Early nutrition and long-term health: a practical approach. Proceedings of the Nutrition Society
2. Vanessa. S (2008), Clinical Pediatric Dietetics.
3. Antia F.P (1997). Clinical Dietetics and Nutrition. Oxford University Press, New Delhi.

Reference Books:

1. ICMR (2010), Nutrient Requirements and Recommended Dietary Allowances for Indians, New Delhi.
2. Mahank and Stump S.E (2008). Krause's Food and Nutrition Therapy. Eleventh edition. Saunders, Publishing Company.
3. IAP Textbook of Pediatrics, 7th edition.

Websites:

1. <https://www.nutrition.gov>
2. <https://www.nal.usda.gov>
3. <https://www.ncbi.nlm.nih.gov>

Course Outcomes:

1. Acquire skill in preparing the various types of weaning foods.
2. Analyze the common diseases of children and plan appropriate menus.
3. Exhibit skills in planning diet for special conditions
4. Suggest suitable diets for nutritional disorders
5. Prepare, administer and practice feeding techniques

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	H	M	H	H	H	M	M	M	M	H	H	H	M
CO 2	H	H	H	M	H	M	M	M	H	M	H	H	M
CO 3	H	H	H	M	H	M	M	M	H	M	H	M	M
CO 4	H	H	H	M	H	M	M	M	M	M	H	H	M
CO 5	H	H	H	H	H	M	M	H	H	M	H	H	M

Management of Food Service

Semester VI
23BFDC11

Hours of instruction per week: 4+4
No. of credits: 6

Course Objectives :

1. Gain knowledge on organisation and management of food service operations.
2. Understand the marketing principles in food service.
3. Comprehend quality concepts in management and disaster management.

	Hours
Unit I Organization in Food Service Operation:	12
Definition, types of organization, organization chart, and theories, Contingency approach.	
Related Experience: Visit to commercial and non-commercial food service institutions.	15
Unit II Principles and Functions of Food Service Management	12
Definition, evolution of management, objectives, tools, principles and functions of management.	
Related Experience: Practical experience in work simplification methods, time and motion study	12
Unit III Marketing Management in Food Service Operation	14
Definition, elements of marketing-Marketing concepts, product life cycle, sales promotion techniques, buying behaviour of individuals in commercial and non-commercial institution.	
Related Experience: Plan sales promotion techniques for food products, menu, restaurant/hotel.	12
Unit IV Current Concepts in Quality Management:	14
Total Quality Management, Management Information System, Quality of Work Life.	
Related Experience: Demonstration of softwares used in MIS and TQM.	13
Unit V Disaster Management	8
Types of disaster- flood, famine, tsunami, earthquake, decision making during calamities, Need for food- preparation, packing, transportation, distribution and storage, sanitation and hygiene in preparation and food handling, health care facilities.	
Related Experience: Form emergency committee – assign specific duties; plan menu for disaster, design/plan appropriate food packaging. Formulate sanitation and hygiene guidelines.	
	8
Total Hours	120

Text Books:

1. **Jyoti.S, Sharma**, (2006), Food Service Modern Technique and Practices, Akansha Publishing House.
2. **Mary B. Gregoire, Marian C. Spears**, (2007), Food Service Organizations, Pearson Prentice Hall
3. **Sethi, M. and Malhan, S.M** (2007). Catering Management an Integrated Approach. WileyEastern Limited, Mumbai.

Reference Books:

1. **Davis, B. Lockwood. A and Stone.S** (2008). Food and Beverage Management. Third Edition. Elsevier Publication.
2. **Andrews, S** (2008). Text book of Food & Beverage Management. Tata McGraw-Hill Publishing Company Limited.
3. **Sethi, M** (2011). Institutional Food Management. New age International (P) Limited. Second edition.

Websites:

1. www.aima.in
2. www.fhrai.com
3. www.iso.org

Course Outcomes:

1. Understand organization structures in food service institutions.
2. Comprehend the theories and principles of management.
3. Demonstrate marketing and sales promotional skills.
4. Aware of concepts of Total Quality Management and softwares used.
5. Manage food requirements in disaster.

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	M	L	L	L	L	L	L	L	L	L	M	M	M
CO 2	M	L	L	L	L	L	L	L	L	L	H	H	M
CO 3	M	H	M	M	H	M	M	M	M	M	L	H	H
CO 4	H	M	L	M	M	M	M	M	M	M	M	H	M
CO 5	M	M	H	H	H	H	M	M	H	M	H	H	M

Entrepreneurship Development and Innovations

Semester: VI

Hours of instruction per week: 4+4

23BFDC12

No. of credits: 6

Course Objectives

1. Understand the need and scope of Entrepreneurship.
2. Foster entrepreneurial traits and techniques.
3. Gain knowledge on legal and managerial aspects of small scale enterprises.

	Hours
Unit I Introduction to Entrepreneurship Development	9
Need, scope and characteristics of entrepreneurship, types of entrepreneurs, Qualities of successful Entrepreneurs and steps in establishing Entrepreneurial systems	
Related Experience:	
Market survey to study the type of products and service from small scale food enterprises	6
Unit II Project Design	12
Steps in project formulation, plant and process layout, network techniques, SWOT analysis.	
Related Experience:	12
Visit enterprises to understand the plant layout, service facilities	
Unit III Financial aspects of an Enterprise	10
Financial institutions, banking and types of banking, financial incentives and subsidies, financial ratios and their significance, bookkeeping, financial statements.	
Related Experience:	12
Document the accounting procedures, software used at food enterprises	
Unit IV Quality Control and Sales Management	14
Meaning and importance of quality control, quality standards, market survey techniques, pricing, packaging, advertising, and sales promotion.	
Related Experience:	
Group discussion on quality standards and regulations practiced at food service operations	15
Unit V Management of Small Scale Industries, Government Schemes to Promote Entrepreneurship	15
Characteristics of small scale industries, social responsibilities and business ethics, sickness and remedial measures in small scale industries.	
Related Experience:	15
Case studies on Government Schemes for Entrepreneurship and training on MSME registration procedures	
Total Hours	120

Text Books:

1. **Gopal.J. Kalantri (2010).**Text book of Entrepreneurship Development. Vision Publications
2. **Gupta.C.B.,Srinivasan.P (2007).** Entrepreneurship Development. Sultan Chand and Sons, New Delhi.
3. **Rathore.B.S.,Saini.J.S (2005).** A Handbook of Entrepreneurship, Aapga Publications, Panchkula,Haryana.

Reference Books:

1. **Ramachandran,K (2018).**Entrepreneurship Development.Mc GrawHillPublishers United States
2. **Khan, M.A (2015).**Food Service Operations. AVI Publications Co., Connecticut.
3. **Chunawalla, A (2013).** Advertising and Marketing Research. Himalaya Publishing House, Mumbai.

Websites:

1. <https://www.startupindia.gov.in>
2. <https://www.india.gov.in/people-groups/community/entrepreneur>
3. <https://www.msde.gov.in>

Course Outcomes:

1. Understand the forms and practices adopted at small scale enterprises
2. Choose resources needed for an enterprise
3. Develop competencies in financial process practiced at the organizations
4. Compile the sales management tasks at the food based business
5. Take up entrepreneurship ventures in food and other related areas.

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	H	H	H	H	H	H	H	H	M	H	H	M	H
CO 2	H	H	H	H	H	H	H	H	M	H	H	M	H
CO 3	H	H	H	H	H	H	H	H	M	H	H	M	H
CO 4	H	H	H	H	H	H	H	H	M	H	H	M	H
CO 5	H	H	H	H	H	H	H	H	M	H	H	M	H

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Department of Food Service Management and Dietetics
Discipline Specific Elective Course
Discipline Specific Elective Course offered by the Department of Food Service Management and Dietetics for the Students admitted from 2023-2024 and onwards

Internship

Semester V
23BFDDE12

Hours of instruction per week: 6
No. of Credits: 6

I. Catering Internship at a Star category Hotel for Four Weeks at the End of Second Year during vacation

1. Observe different department in hotel.
2. Prepare a lay out of the production and service department in the hotel.
3. Use different production and service equipment in hotel.
4. Study basic hotel terminologies.
5. Perform Mis-en place and Mis-en scene in food service area.
6. Aware of guest supplies.
7. Acquire skills on bed making, napkin folds, basic kitchen production, table service and clearing up procedures.
8. Observe front office activities.
9. Planning of menu and cost calculation.
10. Learn Guest handling etiquettes.
11. Presentation of menu and food styling.
12. Maintenance of hotel internship log book.
13. Internship Report writing.
14. Listing of individuals learning out comes from internship.

II. Dietetics Internship at a Multispecialty Hospital for Six Weeks in the Fifth Semester

1. Observe different sections in dietary department.
2. Prepare a lay out of the dietary department.
3. Use different production and service equipment in hospital dietary.
4. Learn basic hospital abbreviation.
5. Take up hospital rounds with senior dietician to assess patient's dietary needs.
6. Read and comprehend case sheet of the patients.
7. Screening of patients for nutritional status.
8. Take diet history of the patients.
9. Plan customised diets.
10. Calculate nutritive value of the planned diet.
11. Setting up of diet tray in the dietary department.
12. Follow up of patient's case sheet and diet history.
13. Experience in outpatient diet counselling.
14. Preparation of diet counselling materials (Charts, Power point presentation, Models, Video).
15. Preparation and presentation of two case study.
16. Maintenance of Dietary internship log book.
17. Internship Report writing.
18. Listing of individuals learning out comes from internship.

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