THIRUVALLUVAR UNIVERSITY, VELLORE – 632115

(B.Sc Nutrition Food Service Management and Dietetics) – 2022-2023 onwards

Programme Objectives(5 Points Compulsory)

1.Utilize knowledge from the physical and biological sciences as a basis for understanding the role of food and nutrients in health and disease processes.

2.Determine the science underlying the properties of various food components, and reactions that occur during food preparation/processing and storage.

3.Demonstrate how to locate, interpret, evaluate and use professional literature to make ethical evidence-based practice decisions related customer service in nutrition and foodservice.

4.Apply best practices and industry standards related to protocol and promotion in nutrition and/or foodservice commercial, public, and non-profit environments.

5.Assess and resolve managerial problems related to nutrition and food service in a global, cultural and diverse society.

Programme Educational Objectives(5 Points Compulsory)

1. Our graduates will have successful Professional carriers in Food Industry, Hospital Sector, Govt sector and also academicians.

2. Our graduates will be active members ready to serve the society locally and Nationally.

3. Being dieticians graduates involved in social work helps the people to recognize the importance of food and teach them to take the diet foods to get the nutritive value of food.

4. Our graduates will continue to learn and do researches through the advanced Technologies.

5. Graduates are trained to demonstrate creatively develop innovative ideas and to work in teams to accomplish a common goal.

Programme Specific Outcomes (10 Points Compulsory)

1. Identify and explain nutrients in foods and the specific functions in maintaining health.

2. Know the basic food microbiology and role of microorganism in food industry

3. Use the nutrition care process to make decisions, to identify nutrition related problems and determine and evaluate nutrition interventions.

4. Identify equipment and ingredients required for bakery and confectionary

5. Explain the spoilage and deterioration mechanisms in foods and methods to control deterioration and spoilage.

6. Explain the principles and current practice of processing techniques and the effects of processing parameters on product quality.

7. Discuss basic principles of common food preservation methods.

8. Explain the properties and uses of nutraceuticals

9. Apply knowledge of nutritional biochemistry and physiology to human nutrition metabolism.

10. Apply the principles in planning therapeutic and normal diet

Programme Outcomes (10 Points Compulsory)

1. Academic Excellence: Develop Professional skills in food, nutrition, dietetics, product making, food service, human development and counselling.

2. Scientific Knowledge: Utilize knowledge from the physical and biological sciences as a basis for understanding the role of food and nutrients in health and disease process

3. Understand: Understand and appreciate the role of interdisciplinary sciences in the development and well being of individuals, families and communities

4. Thinking Skills: Ability to critically think, analyze, evaluate and create new knowledge and skills both in the chosen discipline and across other fields like Food Processing Preservation and Community nutrition

5. Modern Tool Usage: Create, Select and apply appropriate techniques resources and modern technology using industry 4.0

6.Communicative Skills: Communicative effectively on Food Science & Technology activities with society at large and able to write effective reports and documentation and also to participate in public discourse on varied themes.

7. Life Long Learning: Recognize the need and ability to learn and relearn knowledge in the context of technological change

8. Civic and Social Responsibility: Ability to function as a matured democratic citizen as a dietitian to formulate their own personalized product, As a public educator and also as a freelancer

9. Professional Development: The programme provides basic understanding of the correlation between food and health and also understanding the role of food under specific diseased conditions.

10. Quality Research: Ability to design and carryout independent research, to update oneself with current research trends and to evaluate research contribution

THIRUVALLUVAR UNIVERSITY

BACHELOR OF SCIENCE
B.Sc. NUTRITION, FOOD SERVICE MANAGEMENT AND DIETETICS
UNDER CBCS

(With effect from 2022 - 2023)

The Course of Study and the Scheme of Examinations

S. No.	Part	Study Components Course Title		Ins. Hrs / week	Credit	Title of the Paper	Maximum Marks		
		SEMESTER I					**CIA**	**Uni. Exam**	**Total**
1.	I	Language	Paper-1	6	4	Tamil/Other Languages	25	75	100
2.	II	English (CE)	Paper-1	6	4	**Communicative English I**	25	75	100
3.	III	Core Theory	Paper-1	6	4	Food Microbiology	25	75	100
	III	Core Practical	Practical-1	4	0	Food Microbiology	0	0	0
4.	III	Allied -1	Paper-1	4	3	Chemistry I	25	75	100
	III	Allied- 1	Practical-1	2	0	Chemistry	0	0	0
5.	**III**	**PE**	**Paper 1**	**6**	**3**	**Professional English I**	**25**	**75**	**100**
6.	IV	Environmental Studies		2	2	Environmental studies	25	75	100
		Sem. Total		**36**	**20**		**150**	**450**	**600**
		SEMESTER II					**CIA**	**Uni. Exam**	**Total**
7.	I	Language	Paper-2	6	4	Tamil/Other Languages	25	75	100
8.	II	English (CE)	Paper-2	4	4	**Communicative English II**	25	75	100
9.	**II**	**NMSDC I : Language Proficiency for Employability**	**Paper-1**	**2**	**2**	**Effective English**	**25**	**75**	**100**
10.	III	Core Theory	Paper-2	5	4	Human Physiology	25	75	100
11.	III	Core Practical	Practical-1	3	2	A. Food Microbiology B. Human Physiology	25	75	100
12.	III	Allied-1	Paper-2	4	3	Chemistry II	25	75	100
13.	III	Allied	Practical-1	2	2	Chemistry Practical	25	75	100

S. No.	Part	Study Components Course Title		Ins. Hrs / week	Credit	Title of the Paper	Maximum Marks		
		Practical - 1							
14.	**III**	**PE**	**Paper 1**	**6**	**3**	**Professional English II**	25	75	100
15.	IV	Value Education		2	2	Value Education	25	75	100
16.	IV	Soft Skill		2	1	Soft Skill	25	75	100
		Sem. Total		**36**	**27**		**225**	675	**900**
		SEMESTER III					**CIA**	**Uni. Exam**	**Total**
17.	I	Language	Paper-3	6	4	Tamil/Other Languages	25	75	100
18.	II	English	Paper-3	6	4	English	25	75	100
19.	III	Core Theory	Paper-3	5	4	Food Science	25	75	100
	III	Core Practical	Practical	3	0	Food Science	0	0	0
20.	III	ALLIED-2	Paper-3	4	3	Nutritional Biochemistry	25	75	100
	III	Allied Practical	Practical	2	0	Nutritional Biochemistry	0	0	0
21.	IV	Skill based Subject	Paper-1	2	2	Bakery	25	75	100
22.	IV	Non-major elective	Paper-1	2	2	Health and fitness	25	75	100
		Sem. Total		**30**	**19**		**150**	**450**	**600**
		SEMESTER IV					**CIA**	**Uni. Exam**	**Total**
23.	I	Language	Paper-4	6	4	Tamil/Other Languages	25	75	100
24.	II	English	Paper-4	6	4	English	25	75	100
25.	III	Core Theory	Paper-4	5	4	Human Nutrition	25	75	100
26.	III	Core Practical	Practical -2	3	3	A. Food Science B. Human Nutrition	25	75	100
27.	III	ALLIED-2	Paper-4	4	3	Food Preservation	25	75	100
28.	III	Allied Practical-2	Practical-2	2	2	A. Nutritional Biochemistry B. Food Preservation	25	75	100
29.	**IV**	**NMSDC II : Digital Skills for Employability**	**Paper-2**	**2**	**2**	**Office Fundamentals**	**25**	**75**	**100**
30.	IV	Non-major elective	Paper-2	2	2	Nutrition for the Family	25	75	100
				30	**24**		**200**	**600**	**800**
		SEMESTER V					**CIA**	**Uni. Exam**	**Total**
31.	III	Core Theory	Paper-5	6	5	Dietetics - I	25	75	100

S. No.	Part	Study Components Course Title		Ins. Hrs / week	Credit	Title of the Paper	Maximum Marks		
32.	III	Core Theory	Paper-6	6	5	Nutrition Through Life Cycle	25	75	100
33.	III	Core Theory	Paper-7	6	5	Community Nutrition	25	75	100
	III	Core Practical	Practical	3	0	Nutrition through Life Cycle	0	0	0
	III	Core Practical	Practical	3	0	Dietetics - I	0	0	0
34.	III	Internal Elective	Paper-1	3	3	Hospital Food Service Administration	25	75	100
35.	IV	Skill based Subject	Paper-2	3	2	Internship	25	75	100
				30	**20**		**125**	**375**	**500**
		SEMESTER VI							
36.	III	Core Theory	Paper-8	5	4	Dietetics - II	25	75	100
37.	III	Core Theory	Paper-9	5	4	Food Service Management	25	75	100
38.	III	Core Theory	Paper-10	5	4	Human Development and Counselling	25	75	100
39.	III	Core Practical	Practical-3	3	3	A. Nutrition through Life Cycle B. Dietetics - I	25	75	100
40.	III	Core Practical	Practical-4	3	3	A. Food Service Management B. Dietetics - II	25	75	100
41.	III	Core Project	Paper-11	5	5	**Individual / Group Project**	25	75	100
42.	III	Internal Elective	Paper-2	3	3	Food Standards and Quality Control	25	75	100
43.	III	Internal Elective	Paper-3	3	3	Nutraceuticals and Nutrigenomics	25	75	100
44.	IV	Skill based Subject	Paper-3	3	2	Perspectives of Home Science	25	75	100
45.	V	Extension Activities		0	1		100	0	100
46.		**NMSDC III : Employability Readiness**		**0**	**0**	**(choose any one)** **• Naandi** **• Unnati** **• Quest** **• Izpay** **• IBM Skills build**	-	-	
				30	**32**		**325**	**675**	**1000**
					142				**4400**

Semester: I

Paper type: Core theory

Paper code: CNU 11 Name of the Paper: Food Microbiology Credit: 4

Total Hours per Week: 6 Lecture Hours: 6 Tutorial Hours: NIL Practical Hours: NIL

……

Course Objectives

1. Understand the role of microorganisms in spoilage of various foods.
2. Design the principles of food preservation.
3. Outline the destruction of micro-organism.
4. Describe the micro-organism in human welfare.
5. Compare and contrast the micro biology of food poisoning, food infection and food borne diseases.

Course Out Comes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to now the different types and morphology of microorganisms

2. After studied unit-2, the student will be able to understand various specialized techniques in food processing and preservation

3. After studied unit-3, the student will be able to acquainted with various sterilization techniques

4. After studied unit-4, the student will be able to preserve the non-perishable food from microbial contamination and spoilage

5. After studied unit-5, the student will be able to differentiate food poisoning and food borne infections

Matching Table (Put Yes / No in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	No	No	No	No
2	Yes	Yes	Yes	Yes	Yes	No
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yee	Yes

Unit-I: (50 to 100 contents) **Teaching Hours: 6**

UNIT-I

1. Introduction to Microbiology and its relevance to everyday life
2. General Characteristics, Morphology, Reproduction and function of Bacteria, Viruses, Yeast, Moulds, Protozoa and Algae.
3. Economic importance of Moulds, Yeast and Bacteria.

Unit-II: (50 to 100 contents) **Teaching Hours:6**

UNIT-II

1. Use of high and low temperature. Canning of fruits and vegetables.
2. Preservation by drying, use of chemicals in food preservation. Part played by antibiotics in the preservation of fleshy foods.
3. Application of Dry heat, burning, flaming and hot air oven.
4. Application of moist heat, boiling, pasteurization -Advantages involved in
5. Pasteurization, methods – holder, flash. Steam sterilizers and autoclave.
6. Sterilization with the use of filters.

Unit-III: (50 to 100 contents) **Teaching Hours:6**

UNIT-III

1. Importance of microbes in food biotechnology, genetically engineered organisms, probiotics and single cell proteins.
2. Fermentation: Aerobic and Anaerobic respiration. Products of Fermentation- brief knowledge on the preparation of Bread, Malt beverages, Wine, Distil liquor, Vinegar, Fermented Vegetables and Dairy products.

Unit-IV: (50 to 100 contents) **Teaching Hours:6**

UNIT-IV

1. Principles of food spoilage by microbiological, physical and biological factors - Causes of spoilage – Classification of foods based on spoilage ,chemical changes caused by microorganisms.
2. Contamination, preservation and spoilage of cereal and cereal products, baked products, Fruits and vegetables and their products, Fleshy foods, Milk and Milk products, Egg and Egg Products and Fats and oils.

Unit-V: (50 to 100 contents) **Teaching Hours:6**

UNIT-V

1. Microbial food poisoning by Staphylococci, Salmonella and clostridium botulinum (Botulism). Measures to prevent microbial food poisoning.

2. Public health hazards due to contaminated foods - Food borne Infections and Food intoxication symptoms, mode of transmission and methods of prevention of Dysentery diarrhea, Typhoid, Cholera.

Text book:

1. Joshua A.K. : Micro-biology - India Printing works, Madras - 1971
2. Carpenter : Micro-biology - W.B. Saunders Co.,London
3. Salie, A.J.: Fundamental principles of Bacteriology -McGraw Hill Book Co
4. R.C. Rubey & D.K.Maheshwari : A Textbook of Micro - biology
5. Pelczar J.Michael : Micro-biology concepts and Application
6. Ananthanarayan.R & Paniker C.K.J. : Textbook of Microbiology
7. Frazier.W.C. : Food Micro-biology - McGraw Hill Book and Co; New York
8. Smith and Water: Introductory food services - McGraw Hill Book and Co. New York 1975
9.Adams, MR and Moss, MO (2005) Food Microbiology, New Age International (P) Ltd., New Delhi.
10. Jay M.J (2005) Modern Food Microbiology, Fourth Edition, CBS Publishers and Distributors, New Delhi.

Reference Book:

1.Jay M.J (2015) Modern Food Microbiology, Fourth Edition, CBS Publishers and Distributors, New Delhi.
2.Sullia SB and S Shantharam- (1998) "General Microbiology" Oxford and IBH Publishing Ltd.

3.Ramesh, K.V (2012) Food Microbiology, MJP Publishers, Chennai.
4.Tamine, A (2015) Probiotic Dairy Products, Blackwell Publishing, USA
5.Cappuccino G.J and Sherman, N (2008) Microbiology – A Laboratory Manual, Pearson Education Publishers, USA,.

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	S	S	S	M	S	S	M	M	S
CO2	M	M	S	S	M	M	S	M	M	S
CO3	M	M	M	S	M	M	S	M	M	S
CO4	M	M	S	S	M	S	S	M	M	S
CO5	M	S	S	S	M	S	S	M	M	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

ALLIED 1
PAPER - 1

CHEMISTRY – I

OBJECTIVE:

- Basic knowledge on Metallurgy, Cycloalkanes, Polarising Effects, Stereochemistry, Chemical Kinetics, Catalysis, Photochemistry, VSEPR Theory, Fuels, Osmosis, Nuclear Chemistry, Petroleum Chemistry, Chemistry of Naphthalene, Conductors and Applications wherever necessary are to be taught for I- Semester.

UNIT – I

1.1General Metallurgy - Extraction of Metals - Minerals and Ores- Difference between Minerals and Ores – Minerals of Iron, Aluminum and Copper - Ore Dressing or Concentration of Ores - Types of Ore Dressing- Froth Floatation process, Gravity separation and Magnetic separation.

1.2 Calcination, Smelting, Roasting, Fux, Slag - Definition - Reduction methods - Goldschmidt Aluminothermic process and Carbon Reduction method - Refining of Metals - Electrolytic, Van Arkel and Zone Refining.

1.3 Ores of Titanium and Cobalt - Extraction of Titanium and Cobalt.

UNIT – II

1. Cycloalkanes - Preparation – Wurtz reaction and Dieckmann's condensation - Properties of Cycloalkanes – Substitution and Ring opening reactions.

2.2 Polarisation - Inductive effect, Mesomeric effect and Steric effect (Acid and Base Strength).

2.3Stereoisomerism – Types - Cause of Optical Activity – Enantiomers - Diastereomers - Meso form - Optical Activity of Lactic acid and Tartaric acid - Racemisation and Resolution – Definition and Methods - Geometrical isomerism – Definition and example - Maleic and Fumaric acid – Differences.

UNIT – III

3.1 Chemical Kinetics – Rate of a reaction – Definition of Order and Molecularity – Distinction between Order and Molecularity - Derivation of First order rate equation - Half Life Period of first order reaction.

3.2 Catalysis - Catalyst - Autocatalyst - Enzyme catalyst - Promoters - Catalytic poisons

–
Active Centre - Differences between Homogeneous and Heterogeneous Catalysis - Industrial Applications of Catalysts.

3.3 Photochemistry – Grothus-Draper's law – Stark-Einstein's law - Quantum yield – Photosynthesis - Phosphorescence – Fluorescence.

UNIT – IV

4.1 VSEPR Theory – Hybridisation and Shapes of simple molecules BF_3, PCl_5, SF_6 and XeF_6.

4.2 Fuels – Classification of Fuels - Calorific value of Fuels – Water gas, Carbureted Water gas and Producer gas – Composition and Uses - Non-Conventional fuels - Need of Solar Energy - Applications - Biofuels – Oil gas, Natural gas and LPG – Uses.
4.3 Osmosis - Osmotic pressure - Reverse osmosis – Definition - Desalination of Sea water.

UNIT – V

5.1Nuclear Chemistry – Atomic number, Mass number - Isotopes, Isobars and Isotones – Definition and Examples - Definition of Half life period - Nuclear Binding Energy, Mass Defect and N/P ratio - Nuclear Fission and Nuclear Fusion (Elementary idea) - Applications of Radioisotopes in Medicine, Agriculture and Industries – Carbon Dating.

5.2 Crude Oil - Petroleum - Petroleum Refining - Cracking - Applications of Cracking – Naphthalene – Preparation – Haworth's method – Properties – Oxidation, Reduction and Uses of Naphthalene - Structure of Naphthalene (Structural elucidation not necessary).

5.3 Conductors, Insulators, Semiconductors, N- and P- Type Semiconductors – Definitions and Examples.

Semester: II

Paper type: Core theory

Paper code: CNU22 Name of the Paper: Human Physiology Credit: 4

Total Hours per Week: 6 Lecture Hours: 6 Tutorial Hours: NIL Practical Hours: NIL

……

Course Objectives

1. Explain the structure and functions of a typical cells and tissues.
2. Identifying the blood grouping.
3. Determine the blood pressure and ECG.
4. Understand the structure and basic physiology of various organs of the body.
5. Understand the principles of nutrition through the study of physiology.

Course Out Comes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to analyze haematological parameters and blood pressure
2. After studied unit-2, the student will be able to understand the relationship between a cell's structure and its function
3. After studied unit-3, the student will be able to relate the structure with functions of the tissues and organs
4. After studied unit-4, the student will be able to comprehend the structure and functions of the various organ systems of the body
5. After studied unit-5, the student will be able to recognize the clinical symptoms of nutritional deficiencies based on anatomical considerations

Matching Table (Put Yes / No in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	No	No	No	No
2	Yes	Yes	Yes	Yes	Yes	No
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yee	Yes

UNIT-I

1.Introduction to the cell – Structure and function of a typical cell, cell division - Mitosis and Meiosis.

2.Tissues - classification, structure and function of epithelial, muscular, connective and nervous tissues.

Unit-II: (50 to 100 contents) **Teaching Hours: 6**

UNIT-II

1. Blood: Blood composition and function, plasma proteins, distribution functions. Cell components: RBC and WBC -, function, normal count; Blood coagulation, Erythropoiesis, blood grouping. ABO system and RH system

2. Heart and circulation: Structure of the heart and blood vessels, origin and conduction of heart beat, cardiac cycle, ECG, blood pressure – definition and factors affecting it.

Unit-III: (50 to 100 contents) **Teaching Hours: 6**

UNIT-III

1.Respiratory system: Structure of pharynx, larynx, trachea, bronchi, lung and lung cavities. Physiology of respiration- Mechanism of respiration, gaseous exchange in the lungs.

2.Excretory system: Structure and function of kidney and Nephron, urine formation, micturition.

Unit-IV: (50 to 100 contents) **Teaching Hours: 6**

UNIT-IV

1. Structure and function – Secretory Digestive and absorptive functions. Role of Liver, Pancreas and Gall bladder.

2. Neuron structure and functions, Structure of Brain and Spinal cord

Unit-V: (50 to 100 contents) **Teaching Hours: 6**

UNIT-V

1. Autonomic nervous system – sympathetic and parasympathetic.

2. Structure,Functions and Disorders of Endocrine Glands – Pituitary, Thyroid, Parathyroid, Adrenal and Islets of Langerhans.

Text Books:

1. Best and Taylor (1992). The physiological basis for Medical practice. Saunders company.

2. Subramaniam, S. and Madhavan Kutty, K. 1971. The Text Book of Physiology, 1st ed.,Orient Longman Ltd.

3.Chatterjee C.C (2016), Human Physiology 11th Edition, Medical Allied Agency, Kolkata.

4.Sembulingam, K. (2012) Essentials of Medical Physiology, 6 th Edition, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi.

5.Gary.A Thibodeau and Kelvin. T.Patlon, Anthony's Text Book of AnatomyAnd Physiology, Seventeeth edition, Mosby Publications, Indiana Print, 2004.

6. Anne Waugh and Allison Grant Ross and Wilson Anatomy and Physiology In Health and Illness Elsevier Publication, Ninth Edition, 2005.

7. Guyton, A.C, Text Book of Medical Physiology, 4th Edition, W.B. Saunders Co. Philadelphia, 1996.

8. Chaudhri, S.K. Concise Medical physiology, New Central Book Agency, Calcutta, 1988.

9. Best, C.H & Taylor, N.B. The Living Body, Asia publishing House, B.Mumbai, 1964.

10. Vander, A.J; Sherman, J.H and Luciano, D.S. Human physiology – The Mechanisms of Body functions, TMH Publishing Co. Ltd., Delhi, 1990.

Reference Books:

1. Guyton, A.C. Functions of the Human Body, W.B. Saunders Co., Philadelphia.
2. Vander, A.J , Sherman, J.H. and Luciano, D.S. Human Physiology - the Mechanisms of Body Functions, 2nd ed., TMH Publishing Co., Ltd.,
3. Sembulingam (2000). Essentials of Medical Physiology. Second Edition. Jaypee brothers Medical Publishers(P) Ltd, New Delhi.

4. Best, CH and NB Taylor, The living body, latest edition, Asia publishing house, Bombay.
5. Ham, A.W., Histology, Latest edition. Pitman Medical Publishing Ltd., London

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	
CO1	S	S	S	M	M	M	M	M	S	M	
CO3	S	S	S	M	M	M	M	M	S	M	
CO3	S	S	S	M	M	M	M	M	S	M	
CO4	S	S	S	M	M	M	M	M	S	M	
CO5	S	S	S	M	M	M	M	M	S	M	

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

CORE PRACTICAL -I

FOOD MICROBIOLOGY &HUMAN PHYSIOLOGY

Objectives

Enable to gain knowledge related to

- Microscope and its uses
- Identify the yeast, moulds, protozoa and bacteria.
- Identify the tissues and Endocrine glands
- Outline the anatomy of major organs

A. FOOD MICROBIOLOGY

1. Microscope and its use.

2. Examination of Yeast, molds, Protozoa and Bacteria.

3. Examination of wet methods and hanging drop preparations.

4. Examination of stained organisms- Simple Staining and gram staining method.

B. HUMAN PHYSIOLOGY

1. Microscopic study of
    a. Tissues - Epithelial, connective, muscular and nervous tissue
    b. Endocrine Glands – Thyroid, Pituitary, Adrenal and Pancreas.

2. Study of anatomy of Heart, Brain, Kidney

Course Outcomes

After having this Practical, students are enabling to have knowledge in

- Understand the structure and functions of various Organ systems
- Comprehend the mechanisms of action of organs
- Relate the physiology of the human body with food and nutrition requirements

REFERENCES

1.Guyton, A.C, Text Book of Medical Physiology, 4th Edition, W.B. Saunders Co. Philadelphia, 1996.

2.Chaudhri, S.K. Concise Medical physiology, New Central Book Agency, Calcutta, 1988.

3.Best, C.H & Taylor, N.B. The Living Body, Asia publishing House, B. Mumbai, 1964.

4.Vander, A.J; Sherman, J.H and Luciano, D.S. Human physiology - The Mechanisms of Body functions, TMH Publishing Co. Ltd., Delhi, 1990.

ALLIED 1
PAPER – 2
CHEMISTRY – II

OBJECTIVE:

- Basic knowledge on Coordination Chemistry, Industrial Chemistry, Carbohydrates, Aminoacids, Proteins, Electrochemistry, Paints and Pigments, dyes, Vitamins, Medicinal Chemistry, Corrosion and Applications wherever necessary are to be taught for II- semester.

UNIT – I

1.1 Coordination Chemistry - Nomenclature of Coordination Compounds - Ligands, Central Metal Ion and Complex Ion – Definition and Examples – Coordination Number - Werner's Theory of Coordination Compounds - Chelates - Functions and Structure of Haemoglobin and Chlorophyll.

1.2 Industrial Chemistry - Fertilisers and Manures – Biofertilisers - Organic Manures and their importance - Role of NPK in plants - Preparation and Uses of Urea, Ammonium Nitrate, Potassium Nitrite and Super Phosphate of Lime.

1.3 Contents in Match Sticks and Match Box - Industrial making of Safety Matches – Preparation and Uses of Chloroform, DDT, Gammexane and Freons.

UNIT – II

2.1 Carbohydrates - Definition and Examples - Classification – Oxidation and Reduction Reactions of Glucose - Structure of Glucose (Structural elucidation not necessary) - Uses of Starch - Uses of Cellulose Nitrate and Cellulose Acetate.

2.2 Amino Acids – Definition and Examples - Classification of Amino Acids - Preparation - Gabriel Phthalimide Synthesis – Properties – zwitterion and Isoelectric point - Structure of Glycine.

2.3 Proteins – Definition - Classification of Proteins based on Physical properties and Biologcal functions - Primary and Secondary Structure of Proteins (Elementary Treatment only) – Composition of RNA and DNA and their Biological role - Tanning of Leather - Alum (Aluminum chloride tanning) - Vegetable tanning – Chrome Tanning.

UNIT – III

3.1 Electrochemistry - Electrolytes – Definition and Examples – Classification - Specific and Equivalent Conductance - their determination – Variation of Specific and Equivalent conductance with Dilution – Ostwald's Dilution Law and its Limitations.

3.2 Kohlrausch's Law - Determination of Dissociation Constant of weak Electrolytes using Conductance measurement - Conductometric titrations.

3.3 pH – Definition and pH determination by indicator method - Buffer solutions - Buffer action - Importance of buffers in the living systems.

UNIT – IV

4.1Paints - Components of Paint – Requisites of a Good Paint - Pigments – Classification of Pigments on the basis of Colour – Examples - Dyes – Definition – Chromophores and Auxochromes – Examples - Colour and Dyes - Classification based on Constitution and Application – Examples.

4.2 Vitamins – Definition – Classification – Water Soluble and Fat Soluble – Occurrence - Biological Activities and Deficiency Diseases caused by Vitamin A, B, C, D, E and K - Hormones – Definition and Examples – Biological Functions of Insulin and Adrenaline.

4.3 Chromatography - Principles and Applications of Column and Paper chromatography- $R_f$value.

UNIT – V

5.1 Drugs - Sulpha Drugs – Preparation and Uses of Sulphapyridine and Sulphadiazine - Mode of Action of Sulpha Drugs - Antibiotics - Uses of Penicillin, Chloramphenicol and Streptomycin - Drug Abuse and Their Implication - Alcohol – LSD.

5.2 Anaesthetics - General and Local Anaesthetics - Antiseptics - Examples and their Applications - Definition and One Example each for Analgesics, Antipyretics, Tranquilizers, Sedatives - Causes, Symptoms and Treatment of Diabetes, Cancer and AIDS.

5.2 Electrochemical Corrosion and its Prevention – Electroplating – Applications.

ALLIED PRACTICAL

CHEMISTRY

VOLUMETRIC ANALYSIS

1. Estimation of HCl – Standard sulphuric acid.
2. Estimation of Borax - Standard Sodium Carbonate.
3. Estimation of NaOH – Standard Oxalic Acid.
4. Estimation of $FeSO_4$ – Standard FAS.
5. Estimation of Oxalic acid – Standard $FeSO_4$.
6. Estimation of FAS – Standard Oxalic Acid.
7. Estimation of Oxalic acid – Standard Oxalic Acid.
8. Estimation of Fe^{2+} using Diphenylamine / N- Phenyl Anthranilic acid as indicator.

ORGANIC ANALYSIS

Systematic Analysis of Organic Compounds containing One Functional Group and Characterisation by Confirmatory Tests.

Reactions of Aromatic Aldehyde, Carbohydrates, Mono and Dicarboxylic acids, Phenol, Aromatic Primary Amine, Amide and Diamide.

REFERENCE BOOKS

- Inorganic Chemistry - P. L. Soni - Sultan Chand (2006).
- Inorganic Chemistry - B. R.. Puri, L. R. Sharma and K. C. Kallia – Milestone Publications (2013).
- Selected Topics in Inorganic Chemistry - W. U. Malik, G. D. Tuli and R. D. Madan - S. Chand Publications (2008).
- Text Book of Inorganic Chemistry – R. Gopalan, Universities Press – 2012.
- Text Book of Organic Chemistry - P. L. Soni - Sultan Chand & Sons - 2007.
- Advanced Organic Chemistry - Bahl and Arun Bahl - Sultan Chand and Co. Ltd – 2012.
- Organic Reaction Mechanisms - Gurdeep Chatwal- Himalaya Publishing House.
- A Text Book of Organic Chemistry K. S. Tewari, N. K. Vishol, S. N. Mehrotra- Vikas Publishing House – 2011.
- Principles of Physical Chemistry - B. R. Puri, Sharma and Madan S. Pathania, Vishal Publishing Company – 2013.
- Text Book of Physical Chemistry - P. L. Soni, O. P. Dharmarha andU. N. Dash - Sultan Chand & Co – 2006.
- Understanding Chemistry – C. N. R. Rao, Universities Press – 2011.

SEMESTER III

Paper type: Core Theory

Paper code: CNU31 Name of the Paper: Food Science Credit: 4

Total Hours per Week:5 Lecture Hours: 5 Tutorial Hours: NIL Practical Hours: NIL

Course Objectives

1. 1.To enable students to obtain knowledge of different food groups and their contribution to nutrition.
2. To help them study the different methods of cooking and their advantages and disadvantages.
3. To enable them to gain experience in the preparation of foods with attention to the preservation of their nutritive value - oriented to Indian cooking.
4. To help them understand the scientific principles governing the acceptability of food preparations.
5. Develop skill and techniques in Food Preparation with conservation of nutrients and Palatability using cooking methods generally employed.

Course Out Comes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to gain knowledge on food groups and its function, their nutritive value and role in day's diet.
2. After studied unit-2, the student will be able to understand different methods of cooking
3. After studied unit-3, the student will be able to relate skill and techniques in Food preparation with conservation of nutrients, understand the cookery concepts involved in cereals, pulses and vegetables
4. After studied unit-4, the student will be able to comprehend the composition, nutritive value and develop skills in the preparation of milk and fleshy products.
5. After studied unit-5, the student will be able to recognize the smoking point of any cooking oil, evaluate stags of sugar cookery, apply knowledge on preparation of beverages, and the uses and abuses of spices and condiments

Matching Table (Put Yes / No in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	yes	yes	No	No
2	Yes	Yes	Yes	Yes	Yes	No
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yee	Yes

Unit-I: (50 to 100 contents) **Teaching Hours: 5**

UNIT-I

Definition, classification , functions of foods- functions of food in relation to health - classification of foods based on nutrients, food groups- types; application of food groups in planning adequate diets, healthy eating plate.

Unit-II: (50 to 100 contents) **Teaching Hours: 5**

UNIT-II

Preliminary preparation of foods prior to cooking with special reference to conservation of nutrients and palatability, Different methods of cooking -dry methods - frying, broiling, parching, and baking. Moist methods - boiling, stewing, cooking under pressure. Solar cooking, Micro-wave cooking - advantages and disadvantages.

Unit-III: (50 to 100 contents) **Teaching Hours: 5**

UNIT-III

Cereal and Cereal products - Nutritive value of Rice, Wheat and locally available millets. Effect of cooking on the nutritive value of cereals. gelatinization, dextrinization and gluten formation - Pulses and nuts - Composition, Nutritive value of grams, dhals - some common nuts - substitutes - soya products. Effect of soaking, germination, cooking on pulses, toxic constituents of pulses. Textured Vegetable Protein (TVP) - Vegetables and Fruits - Classification, composition and Nutritive value - methods to minimize the loss of nutrients, types of pigments.

Unit-IV: (50 to 100 contents) **Teaching Hours: 5**

UNIT-IV

Milk and milk products - Composition and Nutritive value, Principles of milk cookery, Milk protein, coagulation, problems in milk cookery. Effect of cooking and processing on milk - Meat - Nutritive value, methods of cooking, factors affecting tenderness - organ meat - Fish - Classification, Nutritive value - selection, Methods of cooking - Poultry - Nutritive value, economic aspects. Principles and methods of cooking poultry - Eggs - Structure, composition, Nutritive value, selection - principles of egg cookery - uses of eggs in cookery, methods of cooking eggs.

Unit-I: (50 to 100 contents) **Teaching Hours: 5**

UNIT-V

Fats and Oils - Types - saturated, MUFA, PUFA, Hydrogenation - Invisible fats - uses of fat in cookery - factors affecting absorption of fats - smoking point - Rancidity - Spices and Condiments - Importance, composition and classificiaiton. Uses in Indian cookery - Sugar and Sugar Products - Jaggery - uses in Indian cookery - Stages of sugar cookery - Beverages - Classification, Nutritive value and uses - coffee, tea, cocoa.

Text Books:

1. Srilakshmi. B; Food Science, 6th edition, New Age International (P) Limited Publishers, 2015.
2. Shakunthala Manay. N; Shadakshara Swamy.M; Foods Facts and Principles, 3rd edition, New Age International (P) Limited Publishers, 2014.

3. Lillian Hoagland Meyer, Food chemistry, CBS Publishers and Distributors, 2004.

4. Arindam Ramaswamy, Elements of Food Science, Oxford Book Company, 2010.

5. Norman. N Potter, Joseph H. Hotchkiss, Food Science, 5th edition, CBS Publishers and Distributors, 1996.
6.Sivasankar. B; Food Processing and Preservation, PHI Learning Private Limited, 2011.

7.Chandrasekhar, U (2002). Food Science and Applications in Indian Cookery. Phoenix Publishing House Pvt ltd.
8. Srilakshmi, B (2002). Food Science. New Age International Limited, New Delhi.
9. Srilakshmi, B., Food Science, (2016), 5th edition, New Age Publishers, India, New Delhi.
10. Many, S and Shadaksharaswami, M. (2008) Food: Facts and Principles, 3rd edition, New Age Publishers

REFERENCES

1. Hughes, O and Bennion, M. 1970 **Introductory Foods,** 5th ed., The macmillan Co., New York.
2. Griswold, R.M. 1962. **Experimental Study of Foods,** Houghton mifflin company, Boston.
3. Ghose, R.L.M., Ghate, M.B. and Subramaniam, V. 1960. Rice **in** India. ICMR, New Delhi.
4. Eckles, G.H., Combs, W.S. and Macy, H. 1951. **Milk and Milk Products,** RMB Publishing Co., Ltd., New Delhi.
5. Fisher, P. and Bender, A. 1971. **The Value of Foods.** Oxford University Press, London.
6. Birch, G.C. and Cameron, A.G, and Spencer, M. **Food Science,** 3rd ed., Perganon Press,Oxford.
7. Sweetrnah, M.D. and Mackellar, I, 1954. **Food Science and Preparation.** 4th ed., Johnwiley & Sons Inc., New York.
8. Fitch, J.J. and Francis, C.A. 1953. **Foods and Principles of Cookery,** 1st ed., Prentice-Hall Inc., New York.
9. Pechkham, G.C. 1969. **Foundations of Food Preparation,** The Macmillan Company, London.
10.Swaminathan, M., (2012) Food science, Chemistry and Experimental foods, Bangalore Printing and Publishing Company

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	M	S	M	M	S	S
CO2	S	S	M	S	M	S	M	M	M	S
CO3	S	M	M	M	M	S	M	M	M	S
CO4	S	M	S	S	M	S	M	M	M	S
CO5	S	M	S	S	M	S	M	M	M	S

PO – Programme Outcome, CO – Course outcome
S – Strong, M – Medium, L – Low (may be avoided)

SEMESTER III

ALLIED - 2

Paper type: Allied Theory

Paper code: CANU22 Name of the Paper: Nutritional Biochemistry Credit: 3

Total Hours per Week: 4 Lecture Hours: 4 Tutorial Hours: NIL Practical Hours: NIL

COURSE OBJECTIVES

1. Define biochemistry and relation to Nutrition.
2. Classify the protein based on amino acid.
3. Outline the biosynthesis of fatty acid
4. Understand the types of enzyme and its clinical importance
5. Describe the inborn errors of Metabolism.

Course Out Comes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understand the basic concepts of biochemistry and carbohydrate and its role
2. After studied unit-2, the student will be able to gain knowledge on classification and metabolism of protein
3. After studied unit-3, the student will be able to relate biosynthesis and metabolism of lipid
4. After studied unit-4, the student will be able to apply knowledge on mechanism of enzyme action and its clinical importance

5.After studied unit-5, the student will be able to recognize inborn errors of metabolism

Matching Table (Put Yes / No in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	yes	yes	No	No
2	Yes	Yes	Yes	Yes	Yes	No
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yee	Yes

Unit-I: (50 to 100 contents) **Teaching Hours: 4**

UNIT-I

Introduction to biochemistry and relation to nutrition, carbohydrates- structural classification, metabolism of glucose- Glycolysis, krebs cycle, gluconeogenesis, glycogenesis, glycogenolysis, blood glucose maintenance and its regulation.

Unit-II: (50 to 100 contents) **Teaching Hours: 4**

UNIT-II

Proteins - classification based on amino acid, primary, secondary and tertiary structure of proteins, hydrolysis of proteins, denaturation, precipitation and coagulation, deamination, transamination, decarboxylation- urea cycle

Unit-III: (50 to 100 contents) **Teaching Hours: 4**

UNIT-III

Lipids - chemical composition of fats, classification, metabolism -beta oxidation of fatty acids & bio-synthesis of fatty acids - ketone bodies, Ketogenesis and ketosis, cholesterol-biosynthesis.

Unit-IV: (50 to 100 contents) **Teaching Hours: 4**

UNIT-IV

Enzymes- classification, factors affecting enzyme activity, mechanism of enzyme action, enzyme inhibition, coenzymes and prosthetic group,isoenzymes,

Unit-V: (50 to 100 contents) **Teaching Hours: 4**

UNIT-V

Elementary knowledge on inborn errors of metabolism with reference tocarbohydrate-Fructosuria, Pentosuria, Galactosemia and Glycogen storage disease. Protein -albinism, phenylketonuria, alkaptonuria, maple syrup urine disease,Lipids-Gaucher's disease, Niemann- pick disease, Tay- sach's disease, Fabry's disease,

Text books

1. Jeremy N. Berg, John L.Tymoczko, and Lnbert Stryer (2007). Biochemistry. 6th 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. 6th edition. Miley-Liss, Hocke, NJ.

4. Lehninger. Michael M.Cox, David L.Nelson (2008). Principles of Biochemistry. 5th edition.
W.H. Freeman and Company, New York, Edition.

5. Rodney Boyer (2006). Concepts in Biochemistry. 3rd edition. John Wiley and Sons (Asia)
Pvt.Ltd.

6. Conn E E and Stump P.K. – Outlines of Biochemistry – Wiley Eastern (P) Ltd. New Delhi, 1981.

7. Canteron A and Schepertz B – Biochemistry – W.B. Saunders Co., Philadelphia London,
1967.

8. Mahier and Corder E H – Basic biological chemistry, Kapes and Row, New York, 1968.

9. West E.S., Todd W.R., Mosses R.S., and Van Bruggon J S – Text book of biochemistry –The Macmillan Co., New York 1968.

10.Rama Rao A.V.S.S. 1990 – Text book of biochemistry. 5th edition, L K and Publishers, Visakhapatnam

References

1. Lehninger, A.L, Biochemistry, worth publishers INC, New York, 2000.
2. Nutritional Biochemistry, 2nd edition Tom Bridt, Academic press 2006.
3. Sathyanarayanan, U.,Chakrapani, U., Textbook of biochemistry, 3rd edition, books and allied (p) ltd kolkata, 2010.
4. Lehinger's Principle of Biochemistry (2000), Nelson and Cox.
5. Harper's Biochemistry - Rober K. Murray, Daryl K.Grammer, McGraw Hill, Lange Medical Books ,2010

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	M	M	M	S	M	S	S	M
CO3	S	S	S	S	M	S	S	S	S	M
CO3	S	S	S	S	M	S	S	S	S	S
CO4	S	S	S	S	M	S	S	S	S	S
CO5	S	S	S	S	M	S	S	S	S	S

PO – Programme Outcome, CO – Course outcome
S – Strong, M – Medium, L – Low (may be avoided)

SEMESTER III

PAPER - 1

Paper type: Skill Based Subject

Paper code: CSNU33 Name of the Paper: Bakery and Confectionery Credit: 2

Total Hours per Week: 2 Lecture Hours: 2 Tutorial Hours: NIL Practical Hours: NIL

COURSE OBJECTIVES

1. Understand basic concepts of baking.
2. Discuss with the role of various major and minor ingredients in bakery products.
3. Explain baking process and operation.
4. Determine quality parameters of baking products.
5. Formulate the icing and pasturing preparation.

Course Out Comes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understand the basic ingredients and equipments used in bakery unit
2. After studied unit-2, the student will be able to gain knowledge on types and process of yeast products
3. After studied unit-3, the student will be able to relate preparation techniques followed in cake preparation
4. After studied unit-4, the student will be able to apply knowledge on preparation of cookies and biscuits, able find out faults and remedies in cookies and biscuits preparation
5. After studied unit-5, the student will be able to do icing and pastries products

Matching Table (Put Yes / No in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	yes	yes	No	No
2	Yes	Yes	Yes	Yes	Yes	No
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yee	Yes

Unit-I: (50 to 100 contents) **Teaching Hours: 2**

UNIT - I

Introduction of bakery-definition, principles, types of baked and confectionary products. Major and minor equipment - required to start a small bakery unit. Major and minor ingredients-types, role in bakery

Unit-I: (50 to 100 contents) **Teaching Hours: 2**

UNIT - II

Principals involved in the yeast products preparation, methods, Processing. Faultsand remedies in baked bread, types of bread improvers.

Unit-III: (50 to 100 contents) **Teaching Hours: 2**

UNIT - III

Principles and Methods involved in the preparation of cake, types of cake.Faults and remedies in baked cakes

Unit-IV: (50 to 100 contents) **Teaching Hours: 2**

UNIT - IV

Principles involved in cookies preparation, methods for mixing cookies, types, different between biscuits and cookies ,Faults and remedies in baked biscuits and cookies

Unit-I: (50 to 100 contents) **Teaching Hours: 2**

UNIT - V

Types and Preparation Methods Butter cream - royal icing - almondspaste (or) marzipan - fondant icing - gum paste (or) patellae - American frosting - water icing (or) glace icing - Types and preparation Methods Pastries -, short crust pastry - puff pastry - flaky pastry - philo (or) filo pastry - chore pastry - punish pastry , faults and their causes in making pastry .

Text Books:

1. Wayne Gisslen, The Professional Baking, Sixth Edition, Publishers John Wiley & Sons (2012).
2. Pat Sinclair, Basic Baking, Publisher Agate (2006).
3. John Kingslee, Professional Text to Bakery and Confectionary, First Edition, New Age International (P) Limited Publishers (2006).
4. Yogambal Ashokkumar, Theory of Bakery and Confectionery, Fifth Edition, PHI Learning Private Limited, New Delhi(2009).
5. William C, Practical in baking, 2000
6. Kenneth J.Quail (1996).Arabic Bread production. American Association of Cereal chemist. St.Paul, Minnesota.
7. John Kingslee (2006). A professional text book to Bakery and Confectionary. New Age International Pvt Limited Publisher, New Delhi.
8. Uttam K Singh (2011).Theory of Bakery and Confectionary An operational approach. Kanishka Publishers and Distributors, New Delhi.

Reference Books:

1. Nicolello, I. and Foote, R (2000). Complete Confectionary Techniques. Hodder and Solution, London.

2. Bakers hand Book on practical Baking (2000). Published by U.S. Wheat Associates, New Delhi.

3.Dubey. S.C (2002). Basic Baking. Published by the society of Indian Bakers, New Delhi.

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	M	M	M	S	M	S	S	S
CO3	S	S	S	S	M	S	S	S	S	S
CO3	S	S	S	S	M	S	S	S	S	S
CO4	S	S	S	S	M	S	S	S	S	S
CO5	S	S	S	S	M	S	S	S	S	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

SEMESTER III

PAPER - 1

Paper type: Non-Major Elective

Paper code: CNNU34 Name of the Paper: Health and Fitness Credit: 2

Total Hours per Week: 2 Lecture Hours: 2 Tutorial Hours: NIL Practical Hours: NIL

COURSE OBJECTIVES

1. Understand the importance of health and wellness.
2. Outline the significance of nutrition and exercise.
3. Gain knowledge related to sports nutrition
4. Attain insight on the basic components of physical activity.
5. Understand the principles of yoga and fitness.

Course Out Comes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understand self -reflect on health and fitness status
2. After studied unit-2, the student will be able to gain knowledge on parameters of fitness
3. After studied unit-3, the student will be able to relate the skill on yoga therapy
4. After studied unit-4, the student will be able to apply knowledge on physical exercise and basic asanas
5. After studied unit-5, the student will be able to follow sports nutrition

Matching Table (Put Yes / No in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	yes	yes	No	No
2	Yes	Yes	Yes	Yes	Yes	No
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yee	Yes

Unit-I: (50 to 100 contents) **Teaching Hours: 2**

UNIT - I

Definition of health and wellness - Factors affecting health and wellness. Physiological, psychological and social health.

Unit-II: (50 to 100 contents) **Teaching Hours: 2**

UNIT - II

Definition, parameters of fitness, cardiovascular endurance, muscular strength, muscular endurance, physical fitness tests- for flexibility.

Unit-III: (50 to 100 contents) **Teaching Hours: 2**

UNIT - III

Principles of yoga therapy, social skills and living value based education. Yogic concepts in various diseases like diabetes, CVD, digestion and immune system.

Unit-IV: (50 to 100 contents) **Teaching Hours: 2**

UNIT - IV

Simplified physical exercises and body stretching practices. Basic asanas, suryanamaskar, breathing exercise- pranayama

Unit-V: (50 to 100 contents) **Teaching Hours: 2**

UNIT - V

Basic knowledge on sports nutrition, Basic and special nutritional needs for sea voyage, military and space

References

1. Werner W. K Hoejer (1989), Life time Physical Fitness and Wellness, Morton Publishing Company, Colorado.
2. Greenberg, S. J and Pargman, D (1989) Physical Fitness - A Wellness Approach Prentice Hall International (UK) Limited, London
3. Swaminathan T, (2018) Essentials of Food and Nutrition Bangalore Printing Publishing Co.
4. McArdle, W. D, Frank I. Katch, F. I and Victor L. Katch (1996) Exercise Nutrition: Energy Nutrition and Human Performance. William & Wilkin Publishing USA.
5. Mahan, K and Stump, E. S (1996) Krause Food and Nutrition and Diet Therapy W.B Saunders Company, USA.

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	M	M	M	S	M	S	S	M
CO3	S	S	S	S	M	S	S	S	S	M
CO3	S	S	S	S	M	S	S	S	S	S
CO4	S	S	S	S	M	S	S	S	S	S
CO5	S	S	S	S	M	S	S	S	S	S

PO – Programme Outcome, CO – Course outcome
S – Strong, M – Medium, L – Low (may be avoided)

SEMESTER IV

CORE PAPER - 4

HUMAN NUTRITION

Course Objectives

To enable the students to:

- Define dietary fibre and its role in human nutrition
- Determine the Energy requirement by various age groups.
- Understand the effect of lipid on health status.
- Classify the protein based on the quality.
- Describe the Role of vitamins and minerals.

UNIT-I

Basic concepts of Nutrient, Carbohydrates - Definition, Sources, requirements, Digestion and absorption and metabolism . Dietary fibre definition ,types-soluble and insoluble fibre, sources of fibre, physiological effects of dietary fibre, role of fibre in human nutrition, requirements. Water -functions, water compartment, regulation ,water balance, and disorders of water balance.

UNIT-II

Energy units , determination of energy value of foods using Bomb calorimeter, gross calorific values, Physiological energy value of foods,determination of energy requirement using direct calorimetry.RQ,SDA of food, indirect calorimetry - Basal metabolism - definition, determination, factors affecting BMR - determination of energy metabolism during work - energy requirements for various types of activities, recommended dietary allowances for energy for various age groups.

UNIT-III

Lipids - Definition, sources, requirementsand functions. Digestion ,absorption and metabolism Essential Fatty Acids (EFA) - definition, functions, sources and effects of deficiency. , Protein - Definition, , sources, requirements and functions. Amino acids - Indispensable and dispensable amino acids - special function of amino acids - protein deficiency - Evaluation of protein quality - PER, BV, NPU, NPR, chemical score, mutual and amino acid supplementation of proteins.

UNIT-IV

Fat soluble vitamins and Water soluble vitamins - functions, deficiency, sources, requirements and hyper-vitaminosis.

UNIT-V

Macro, Mirco and Trace elements - functions, sources, requirements and deficiency.

Selenium and Vitamin E relationship, Chromium and glucose tolerance factor.

Course Outcomes

- Apply knowledge of biochemistry and physiology to human nutrient metabolism
- Gain knowledge on the role of nutrition for health and wellness
- Able to find the functions of specific nutrients in maintaining health

References

1. Shubhangini. A. Joshi; Nutrition and Dietetics III edition, McGraw Hill Education (India) private limited ,2015.
2. Srilakshmi.B; Nutrition Science, 15th edition, New Age International (P) Limited, Publishers, 2016.
3. Swaminathan. M; Advanced Text-Book on Food and Nutrition, Volume I 2nd edition. The Bangalore Printing and Publishing Co., LTD, Reprint 2015.
4. Sunetra Roday; Food Science and Nutrition, 2nd edition, Oxford University Press, 2013
5. Carol Byrd - Bredbenner; Wardlaw's perspecctives in Nutrition, 9th edition MCGraw - Hill International Edition 2013

CORE PRACTICAL II

FOOD SCIENCE AND HUMAN NUTRITION

Course Objectives

To enable the students to:

- Acquire knowledge on the techniques used in measurement of food stuff.
- Gain knowledge to Formulate different recipes using basic 5 food groups.
- Ability to prepare different types of beverages.
- Acquire skills to analyze the reducing sugar and Minerals present in the food materials

A. FOOD SCIENCE RELATED PRACTIALS

1. Technique in measurement of food stuff - use of standard measuring cups and spoons.
2. Different recipes from cereals, pulses, vegetables, fruits, fleshy foods, egg, milk and milk products.
3. Beverages - preparation of stimulating, nourishing and refreshing beverages
4. Fats and oils - preparation of shallow and deep fried foods.
5. Sugar cookery - preparing recipes at different stages of sugar cookery.

EXPERIMENTAL COOKERY PRACTICAL

1. Cereals

Microscopic study of different starches

a. Methods of combining starch and boiling water
b. Study of effects of moist heat on starch
c. Preparation of white sauces and soups
d. Gluten formation

2. Pulses - Effect of hard and soft water, alkali and acid. Cooking time of grams

and dhals.

3. Vegetables - Effect of acids, alkali, covering, steaming and pressure cooking on the different pigments and acceptability of vegetables.
4. Fruits - Study of different methods of preventing enzymatic browning of cut fruits, pectin content of fruits.
5. Eggs - Coagulation of egg protein - factors. Egg white foam - effect of beating, sugar, acid and temperature.
6. Milk cookery - Coagulation of milk protein, paneer, cooking of vegetables in milk
7. Fats and oils - comparison of smoking temperature of some fats and oils.
8. Sugar and Jaggery - Different stages of crystallization of sugar.
9. General visit to food Industry and Factories

B.HUMAN NUTRITION

1. Quantitative estimation of reducing sugar by Benedict's method
2. Quantitative estimation of calcium
3. Quantitative estimation of phosphorous.
4. Quantitative estimation of vitamin C.
5. Demonstration Experiments.

- Estimation of total nitrogen in foods (Micro or Macro
- kjeldahl method)
- Lipid extraction
- Demonstration of Iodine value
- Estimation of Iron

Course Outcomes

- Gain knowledge on various food groups, role of food items in Indian cookery
- Understand the changes taking place in nutrients while cooking

- Understand the techniques to minimize the nutrients losses while cooking
- Gain knowledge on qualitative and quantitative analysis on nutrients present in the given solution.

References

- Varley, H., Gowenlak, A.H. and Hill, M. Practical Clinical Biochemistry, William Itinmaon Medical Books, London, 2000.
- Oser, B.L., Harke's Physiological Chemistry XIV Edition Tata McGraw Hill Publishing Company Ltd., Bombay, 2001
- Sadasivam, S. and Manickam, A. Biochemical Method, Second Edition,New Age International P. Ltd., Publishers, New Delhi, 2003.
- Raghuramulu, N., Madhavannair, K. and Kalyana Sundaram, National Institute of Nutrition, 2013, A Manual of Laboratory Techniques, Hyderabad, 500007

ALLIED - 2

PAPER -4

FOOD PRESERVATION

COURSE OBJECTIVES

To enable the students to:

- Understand the principles of preservation.

- Acquire knowledge on the preservation by high osmotic pressure and concentration of salt.
- Understand various types preservation by using high and low temperature.
  Learn various types of preservation using chemicals and food irradiation.
- Compare and contrast the drying and dehydration.

UNIT-I

Principles and importance of food preservation,need for preservation, types of spoilage, role of micro organism in food spoilage, prevention of food spoilage, shelf life of food products, factors affecting shelf life.

UNIT - II

High concentration of sugar, Procedure for fruit jelly and jam, fruit preserves,failure to jelly and jam to set.Pickling and Curing of meat.Fermentation-.types,advantages and factors affecting.

UNIT-III

Factors affecting heat resistance, canning procedures, spoilage of canned foods, heat sterilization, pasteurization.Refrigeration - Advantages, factors to beconsidered, common spoilage - Difference between refrigeration and freezing, methods of freezing, steps involvedin freezing, common food spoilage. Basic concepts of hurdle technology and membrane technology.

UNIT-IV

Chemical preservatives - definition, classification, mode of action, mechanism.Properties and safety of irradiation, advantages, mechanism permitted doses.

UNIT - V

Home drying, methods of dehydration, factors in the control of drying, treatmentof foods before drying, procedures after drying, intermediate moisture foods, merits and demerits, factors affecting drying.

Course Outcomes

- Apply major food preservation techniques and principles
- Classify the various types of food spoilage
- Analyze and evaluate novel food processing methods
- Distinguish between chemical preservation and fermentation
- Identify and evaluate the suitability of processing for various foods

REFERENCES

1. Srilakshmi. B; Food Science, 6th edition, New Age International (P) Limited Publishers, 2015.
2. Shakunthala Manay. N; Shadakshara Swamy.M; Foods Facts and Principles, 3rd edition, New Age International (P) Limited Publishers, 2014.
3. Subbulakshmi. G and Shobha. A.U; Food processing and preservation, New Age International (P) Limited Publishers, 2014.
4. Norman. N Potter, Joseph H. Hotchkiss, Food Science, 5th edition, CBS Publishers and Distributors, 1996.
5. Sivasankar. B; Food Processing and Preservation, PHI Learning Private Limited, 2011.

ALLIED PRACTICAL

NUTRITIONAL BIOCHEMISTRY AND FOOD PRESERVATION (Allied) Practical

COURSE OBJECTIVES

To enable the students to:

- Determination of carbohydrates, protein and minerals - Qualitative tests.
- Classify the class I and class II food preservatives.
- Explain the Traditional methods of food preservation.

A. NUTRITIONAL BIOCHEMISTRY

1. Identification of carbohydrates (Qualitative Tests)

2. Identification of proteins (Qualitative Tests)

3. Qualitative tests for minerals.

B. FOOD PRESERVATION

1. Preservation of food items by the use of high and low temperatures.

2. Traditional methods of food preservation a) Drying b) Salting c) Changes during drying

3. Preservation of foods by the use of class I and class II Preservatives

4. Use of sorbic acid and sulphurdioxide as an antimicrobial preservatives.

5. Visit to Preservation Unit.

NON-MAJOR ELECTIVE

PAPER - 2

NUTRITION FOR THE FAMILY

COURSE OBJECTIVES

To enable the non major students to:

- Understand the Classification of basic 5 food groups.
- Study the nutritional needs for special physiological conditions.
- Understand the types of supplementary foods

UNIT - I

Food groups- basic five, nutritional classification of foods - energy yielding, body building and protective foods - Basic principles of Meal planning - balanced diet- meaning, food guide pyramid.

UNIT - II

Nutrition during Infancy - dietary guidelines for infants, advantages of breast feeding, disadvantages of bottle feeding; Weaning foods (definition) and types of supplementary food.

UNIT - III

Nutritional needs of pre-school children, factors to be considered while planning meals for pre-school children,food habits of preschool children.

UNIT - IV

Nutrition for School children and Adolescence - dietary guidelines, factors considered in planning packed lunch. School lunch feeding problems. Nutrition during Adolescence - general dietary guidelines; Dietary Problems (Eating Disorders)

UNIT - V

Nutritional needs of Adults and Old Age - dietary guidelines for adults. Nutrition during Old age - physiological changes in ageing, psycho-social factors affecting food intake. Nutrition modification in Diet.

Course Outcomes

- Able to classify food groups based their functions
- Understand weaning and supplementary foods for infants
- Able to plan and prepare packed lunch

References

1. Mahan,L.K &Arlin.M.T, “Krause’s Food,Nutrition and Diet Therapy”, 11th Edition, W.B. Saunder Company, London, (2000).
2. Selelstein. S. & Sharlin.J, “Life Cycle Nutrition”, Jones & Bartlett publications,(2008).
3. Begum. M. R, “A Textbook of Food, Nutrition & Dietetics”, 3rd edition, Sterling publications Pvt. Ltd., (2008).
4. Srilakshmi. B, “Nutrition Science”, 5th edition, New Age International Pvt.Ltd., (2008).
5. .ICMR-Nutritive value of Indian Foods, National Institute of Nutrition, Hyderabad, (2019).

SEMESTER V

CORE PAPER – 5

DIETETICS-I

COURSE OBJECTIVES

To enable the students to:

- Understand the role of modified diet for prevention of diseases
- Understand the principlesmenu planning and serving therapeutic diet.
- Develop a skill to Calculate nutritive values of Therapeutic diet
- Develop a capacity to Plan and prepare therapeutic diet for ill health conditions.

UNIT - I

Definition, purpose and principles of a therapeutic diet, factors to be considered in the modification of normal diet into therapeutic diets. Types of hospital diet - Clear fluid, full fluid, soft, light, bland and regular diet. Special feeding methods - tube feeding, parenteral nutrition.Role of dietitian in managing hospital dietary.

UNIT - II

Prevalence, Types - Type-I, Type-II, Malnutrition Related Diabetes Mellitus, Gestational Diabetes Mellitus, Etiology, symptoms, nutritional requirements and dietary management of Diabetes Mellitus - (Glycemic Index, Food exchange list) and complications.

UNIT - III

Prevalence, Pathogenesis, Symptoms, risk factors and modification of diet in cardiovascular disease - Atherosclerosis, Hypertension and Hypercholesterolemia .

UNIT - IV

Host defense mechanisms causes and general dietary conditions of fevers - Symptoms and signs of Typhoid, Influenza, Malaria, Tuberculosis and pneumonia.

UNIT - V

Causes, Symptoms and Dietary management of Gastritis, Peptic ulcer, diarrhea, constipation, Ulcerative colitis, diverticulous, Irritable Bowel Syndrome, malabsorption syndrome - Crohns Disease, Sprue/ Tropical Sprue, hemorrhoids, ulcerative colitis.

Course Outcome

1. Able to understand principles of diet therapy

2. Able to modify normal diet for therapeutic purpose

3. Understand the role of dietitian

4. Gain knowledge about etiology, risk factors and clinical features of various disease conditions

.

References

1. Shubhangini. A. Joshi; Nutrition and Dietetics, 3rd edition, McGraw Hill Education (India) Private Limited.
2. Srilakshmi . B; Nutrition Science, 15th edition, New Age International (p) Limited, publishers, 2016.
3. Swaminathan. M; Advanced Text-Book on Food and Nutrition, Volume I and 11 2nd Edition, The Bangalore printing and publishing co., LTD, Reprint 2015.
4. Sunetra Roday; Food Science and Nutrition, 2nd edition, Oxford University press, 2013.
5. Carol Byrd - Bredbenner; Wardlaw's perspectives in Nutrition, 9th edition McGraw - Hill International Edition, 2013.

CORE PAPER - 6

NUTRITION THROUGH LIFE CYCLE

OBJECTIVES

To enable the students to:

- Understand the importance of nutrition during life span.
- Develop a skill to plan and prepare a diet for various age group.
- Study the nutritional needs for physiological conditions.
- Develop a skill to prepare infant feeding formulas.

UNIT-I

Basic concepts of RDA for Indians, Purposes and requirement,. General concepts about growth and development through different stages of life and their energy and other nutrients for their growth and development.

UNIT-II

Rate of growth, weight as the indicator, Nutrition allowances for the infants. Breast feeding. Weaning foods for infants. Premature infant and their feeding, formulas. Lactose intolerance..Growth and development of preschool children, Food habits and nutrient intake of preschool children. Dietary allowances and supplementary foods. Malnutrition in pre school children. Feeding programmes for pre school children.

UNIT-III

Physical development, Nutritional status of school children, school lunch program, factors to be considered in planning a menu, food habits and nutritional requirement, packed lunch..Changes of growth characteristics of adolescents. Nutritional needs and nutritional problems of the adolescents (eating disorders).

UNIT-IV

ICMR Nutrient allowances, Dietary guidelines.Nutritionfor adults. Basis for requirement - Common nutrition related problem of pregnancy, food plan for pregnant women. Lactation- physiology, hormonal control and reflex action, efficiency of milk production, composition of breast milk and problems encountered during breast feeding. Current scenario in the field of Nutrition in pregnancy and Lactation.

UNIT-V

Nutrition allowances - Dietary Guidelines - Nutrition and work efficiency modifications in diet. Physiological changes in aging - psycho-social and economical factors affecting eating behavior. Effects of ageing on nutritional health.

Course Outcomes

- Know about growth and development from infancy to adolescent
- Understand nutrition requirement during pregnancy and lactation
- Able to plan and prepare a menu for different age group based on RDA
- Able to fulfill the nutritional needs of various age groups

References

1. Mahtab S.Bamji, Prasad Rao, N.Vinodini Reddy; Textbook of Human Nutrition, Second Edition Oxford and IBH Publishing Co. Pvt .Ltd, 2003.
2. Judith E. Brown., Nutrition Now, 2nd edition, West / Wadswroth west / Wadsworth, An International Thomson publishing company, 1998.
3. Nutrient Requirement and Recommend Dietary Allowances for Indians by Indian council of Medical research, National Institute of nutrition, Hyderabad.
4. Gordon. M. Wardlaw et.al; Contemporary Nutrition, 2nd edition, Publishing by Mosby, 2004.
5. William's; Nix; Basic Nutirtion and Diet therapy, 14th edition, Publishing by Mosby, 2013.
6. Srilakshmi. B; Dietetics, 7th edition,New Age International (P) Limited Publishers, 2014.

CORE PAPER - 7

COMMUNITY NUTRITION

COURSE OBJECTIVES:

To enable the students to:

- Understand role of Community Nutrition to maintain the health status
- Understand nutrition problems existing in the community.
- Develop a skill to assess nutritional status of the community
- Knowledge to apply nutrition policy and programs in alleviating nutritional problems.
- Inculcate the skills to deliver nutrition services.

UNIT-I

Nutrition and Health in National Development. Concept of Community, Types of Community, Factors affecting the health of community.Malnutrition - Etiology, symptoms, Prevalence of malnutrition, factors contributing to malnutrition - Under nutrition and Over nutrition, balance between food and population growth.

UNIT-II

Nutritional problems confronting our country - PEM - Prevalence, classification - Kwashiorkor and Marasmus - etiology, symptoms, pathological changes, biochemical changes. Prevalence, etiology, symptoms, prophylaxis programmes - Anaemia, IDD and Vitamin A deficiency

UNIT-III

Methods of assessment of Nutritional status - sampling techniques - identification of risk group. Direct methods- anthropometry, biochemical estimation, clinical, and diet survey. Indirect methods- Food balance sheet, , Ecological parameter and vital statistics, use of growth chart.

UNIT-IV

Nutrition policy and programmes - National Nutrition policy - need for nutrition policy, policy strategies and their implementation - ICDS, Noon Meal Programme, FAO, WHO, UNICEF, CARE, ICMR, ICAR, CSIR, NIN, CFTRI,NGOs, National Nutrition surveillance system, National prophylaxis programmes for IDA,VAD and IDD,.

UNIT-V

Strategies to combat Nutritional problems-fortification, enrichment, supplementation and Immunization programmes. Nutrition Education - Meaning, Scope, Methods - Planning, conduct and evaluation of Nutrition education Programme.

Course Outcomes

- Understand the role of interventions to enhance wellness in diverse individuals and groups
- Skills to develop an educational program for a target population
- Capable to formulate new food products for a target group
- Evaluate impact of nutritional awareness program on Nutritional and health status

References

1. Park J.E. and park K. Text book of preventive and social medicine, Publications, 2014.
2. B. Srilakshmi, Nutrition Science New Age International (CP) Ltd, New Delhi, 2019.
3. Mahtab, S. Bamji, N. Pralhad rao, Vinodini Reddy, Text book of Human Nutrition, Oxford and IBIT Publishing co Pvt. Ltd, New Delhi, reprint 2009.
4. Dietary guidelines for Indians, ICMR, NIN, Hyderabad 2010.
5. Bamji, M.S, Prahalad Rao N, Reddy V, Textbook of Human Nutrition II Edition, Oxford and PBH publishing Co. Pvt. Ltd, New Delhi 2014.
6. Jelliffe, and Jelliffe D.B: Assessment of Nutritional Status of the community. World Health Organization.1986

INTERNAL ELECTIVE

PAPER - 1

HOSPITAL FOOD SERVICE ADMINISTRATION

COURSE OBJECTIVES:

To enable the students to:

- Define role of hospital food service administration.
- Develop skills to maintain medical records.
- Understand the management of resources in hospitals.
- Describe the principles of hospitalmanagement.
- Design hospital diets and housekeeping department.

UNIT - I

Hospital based health care and its changing scenario, Effects of globalization on health care, concepts of corporate hospitals in developing countries, infrastructure and lay out of an ideal corporate hospital, functioning of modernhospital and changing needs of patients.

UNIT - II

Patient Care Services, Patient Admission / discharge, cafeteria and dietary services, front office services, housekeeping services, blood bank, diagnostic services, lab,physiotherapy, pharmacy operation theatre, outpatient and inpatient ward -admission

UNIT - III

Principles of hospital management,managerial activities for effective hospital functioning duties and responsibilities of hospital managers, qualities of office managers, effective inter and intra departmental co-ordination, understanding functioning of corporate multi specialty hospital

UNIT - IV

Marketing and Material management, Human resource management, managerial accounting and financial management, importance of material management, principles of material management, inventory management. Types of computer systems used for

reservation systems, point of sale systems (POS) and property management systems.(PMS)

UNIT - V

Hospitality in hospital care-management of dietary department, diet planning for hospital diets, purchasing, storage and quantity food production, patient compliance, food production, serving to patient- tray and trolley service, plate, waste management, washing and garbage disposal.

COURSE OUTCOME

- Planning of menu to accommodate the nutritional, dietary and medical needs, cultural and religious requirements and personal preferences of clients
- Manage nutritional needs of diverse clients in healthcare and other food service settings in collaboration with or under the direction of health care professionals
- Promote food and nutrition services and healthy living to support marketing plans and the general well-being of clients

REFERENCES:

1. Sudhir Andrews, Front Office Management and Operations, 2008, Tata Mc Graw - Hill Publishing Company Ltd.
2. Sakharka B M, Principles of Hospital Administration and Planning, 2009, 2nd Edition, Jaypee Brothers Medical Publishers (p) Ltd.
3. Sherry Glied and Peter Smith, The Oxford Handbook of Health Economics,2011
4. Jan Abel Olsen, Principles in Health Economics and Policy, 2009, Oxford University Press.
5. Mohinder Chand, Managing Hospitality Operations, 2009, 1st Edition, Anmol Publications Pvt. Ltd. New Delhi.
6. Goel S.L, Health Care System and Hospital Administration, 2009, Vol.7, Deep and Deep Publications Pvt. Ltd.

SKILL BASED SUBJECT

PAPER - 3

INTERNSHIP

OBJECTIVES

To enable the students to:

- Identify the nutrition related problems
- Understand the principles of menu planning
- Skills to Calculate nutritive value for planned diet
- Understand role of dietitian in planning, preparing and distribution of therapeutic diet.

Internship:

A phase of training where in a graduate is expected to conduct actual practice in a hospital industry for a period of 30 Days so as to acquire job oriented skills

Assessment:

Interns shall maintain a record book which shall be verified and certified by the training authority under whom he or she works during his/her internship period.

An objective evaluation of his/her knowledge, skills and attitude during training will be recorded by the center in-charge and monitored by faculty in-charge and marks shall be allotted accordingly.

Hospital authority	-	75
Internal Assessment & Viva Voce	-	25

Course Outcomes

Gain skill in planning therapeutic diets

Ability to be a health professional

Apply the knowledge for diet counseling

Competent to manage catering outlet

Skills to imitate an entrepreneurship venture

SEMESTER VI

CORE PAPER - 8

DIETETICS - II

COURSE OBJECTIVES

To enable students to

- Knowledge to classify the principles of diet therapy and types of therapeutic diets.
- Develop attitude for taking up dietetics as a profession.
- Understand the concepts of food sensitivity and genetic disorder.
- Ability to classify the stages of HIV infections and medical nutritional therapy.
- Compare and contrast the modification of diet in obesity and underweight.
- Outline the disease of liver, gall bladder and pancreas.

UNIT - I

Etiology, clinical symptoms and modification of diet in disease of Liver and Gall bladder.a) Hepatitis , b) Cirrhosis, c)Hepatic Encephalopathy d)Cholecystitis e) Cholelithiasis f) Pancreatic Surgery - Causes and Dietary Management.

UNIT - II

Etiology, Assessment of Obesity and modification of diet in Obesity and Underweight.

UNIT - III

Etiological factors, Etiology and modification of diet in disease of the Kidney-Glomerulonephritis, Nephrosis ,Acute and Chronic Renal Failure ,Dialysis ,Urinary Calculi.

UNIT - IV

Risk factors ,symptoms ,Nutritional problems of cancer therapy and modification of diet in cancer ,role of antioxidants in cancer. Stages of HIV Infections, Medical Nutritional Therapy.

UNIT - V

Types of reaction,symptoms,Diagnosis and treatment offood sensitivity. Symptoms and management of diet in phenylketonuria, Galactosemia , Fructosuria.

Course Outcomes

- Gain knowledge on the role of diet therapy for various disease conditions
- Apply the knowledge in planning preparation and distribution of therapeutic diets for various disease conditions
- Enable to counsel related to the dietary management
- Equip to become a dietitian on hospital industries.

References

1. Antia, F.P, Clinical dietetics and Nutrition ,4th Edition, Oxford University Press, Delhi,2012.
2. Joshi, S.A, Nutrition and Dietetics,2nd edition, TATA McGraw Hill publications, New Delhi.2018.
3. 3.Mahan,L.K.,Arlin.M.T.,Krause's,Food,NutritionandDietTherapy,11thedition, W.B.Saunder Company, London ,2010..
4. Raheena Begum, A Text Book of Foods, Nutrition and Dietetics, Sterling Publishers, New Delhi.
5. National Institute of Nutrition, Dietary Guidelines for Indians - A Manual, Hyderabad, 2005
6. Srilakshmi. B, Dietetics, 5th Edition, New Age International (P) Ltd, Publishers, Chennai, 2018

CORE PAPER - 9

FOOD SERVICE MANAGEMENT

CourseObjectives

To enable the students to:

- Explain functioning of different types of food service institutions.
- Able to understand the types of kitchen and kitchen layout
- Understand the space allocation and arrangement of food service units.
- Develop a skill on the concept of quantity food cookery
- skills in effective utilization of resource management in food serviceindustry.

UNIT- I

Food service industry- Definition - types of catering- Hotel, Motel, Restaurant, Cafeteria and chain hotels. Welfare - Hospital, School lunch, Residential establishment and Industrial catering - Transport- Air, Rail, Sea and Space, Miscellaneous - Contract and outdoor.

UNIT - II

Layout of kitchens, types of kitchens - Planning of Receiving preparation, storage and service area with relevant too spacingFood purchase- Procedures and Factors involved in the selection offood.

UNIT - III

Quantity food service- Definition, objectives, styles of service- waiter service, self - service, vending. Mechanics of waiter service.Equipment-Classification, factors involved in selection, use and care of major equipments, traditional and modern equipment - Menu planning- Origin of menu, importance of menu planning. Types of menu- table d'hote menu, a la carte,Dujour, theme, static, cycle. French classical menu. Use of menus,

construction of menus,Menu Design, Factors affecting menu planning.Standardisation of Recipes and portion control.

UNIT - IV

Management- Definition, principles, Functions and tools of management, qualities of a good leader, styles of leadership - Resource management-Money, Time, Energy, Computer applications in menu planning.

UNIT - V

Personnel management- Recruitment, selection and induction. Financial management-Cost control- methods of food cost control, Book- keeping; advantages of the double entry system.Sanitation and safety- Sanitation of Plant and Kitchen Hygiene, Personal Hygiene, First aid principles and practice,Health and Safety at work.Use of fire extinguishers.

COURSE OUTCOMES

- Establish a food service unit
- Manage human resources and solve problems with remedial measures
- Analyze and implement quality control in food service institution
- Promote the product in the market

REFERENCES

1. Kaufman,R. Mega planning- Practical tools for Organisational Success, Sage Publications Inc, 2000.

2. Shring Y, P. Effective Food Service Management, Anmol publications Pvt Ltd,New Delhi, 2001. 3. Stephen, B, , Williams, S, R, “Bill Jardine, and Richard, J, N, Introduction to Catering,
3. Ingredients for Success, Delmar- Thomson learning, 2001.
4. Yadav, C, P. Management of Hotel and Catering Industry, Anmol publications Pvt
5. Ltd and Institute of sustainable development, Lucknow, New Delhi, 2001
6. Mohini Sethi and Surjeet Malham, “ Catering Management - an integrated approach”, 2nd edition, Wiley Eastern Limited, New Delhi, Reprint 2007.

CORE PAPER - 10

HUMAN DEVELOPMENT AND COUNSELLING

COURSE OBJECTIVES:

To enable the students to

- Understand the concept of growth and development
- Acquire knowledge on prenatal development
- Study the prenatal and postnatal care.
- Learn the physical, cognitive and social development
- Develop a skills to outline children with special needs

UNIT-I

The concept of development and growth - principles governing growth and development, developmental tasks of different stages.Stages of Life span - conception, infancy, early childhood, late childhood, adolescence, adulthood, middle age and old age.

UNIT-II

Prenatal Development - Conception, test tube baby, Periods of prenatal development - signs of pregnancy. Prenatal care - Management of normal pregnancy - hygiene, diet and medical supervision and hazards during pregnancy.Labor - signs of labor, stages of labor - types of birth, multiple pregnancy. Post-natal care, prevention of gynecological complications. Adjustment of the newborn to temperature, breathing, feeding and elimination.

UNIT-III

Infancy (Birth to 2 years) - Development - physical and motor, social, emotional, cognitive and language, Minor ailments. Effect of stimulation - care of infants, feeding, toilet training, bathing, clothing, sleeping and immunization, prevention of accidents, importance of mothering and emotional growth. Importance of psychological needs.

UNIT- IV

Early childhood (preschool stage 2 - 6 years) - Physical and motor development, emotional, social, cognitive and language development, creativity, importance of play, importance of family relationship, behavior problems - causes and treatment.Importance of preschool education. Late childhood (Elementary school period 6 - 12 years) - Developments - physical, social, emotional, cognitive and language. Sex Education. Children with special needs - identification and rehabilitation.

UNIT-V

Adolescence (12 - 18 years) Physical, emotional, intellectual and motor development, personal adjustment and maladjustment. Delinquency - causes, prevention and rehabilitation. Drug addiction and alcoholism - rehabilitation.Adulthood (18 - 60 years) - Characteristics and developmental tasks. All aspects of development and vocational development.Old age (60 years and above) - Physical and psychological changes, problems of the aged, family attitude towards the aged, place of the aged in Indian society.

COURSE OUTCOME

1. Understand the principles of studying growth and development

2.Recognize the eight stages of human life span

3. Know the concept of prenatal and postnatal care

4. Understand the physical and psychological changes in old age

REFERENCES

1. Devadass, R.P; Jaya, N. A Text Book on Child Development, Macmillan Indian Ltd., Delhi, 1996.
2. Mussen etal. Child Development and personality, Harper and Row publishers, New York, 1990.
4. Suriakanthi. A. Child Development, Swagath Fine Auto, Sivakasi, 1991.
5. Suriakanthi, A. A Handbook on Human Development, Gandhigram Rural University, Gandhi gram, 1992.
6. Hurlock,E.B., (1995): Developmental Psychology-A life span approach, 5th Edition, McGraw Hill Book Co., New York.
7. Nanda V.K., (1998): Principles of Child Development, Anmol Publications Pvt. Ltd., New Delhi.

CORE PRATICAL - III

DIETETICS-I & NUTRITION THROUGH LIFE CYCLE PRACTICAL

DIETETICS-I

Planning and preparing of diets for the following conditions/ stages.

1. Clear fluid, full fluid and soft diet.

2. Diet in fever - Typhoid, tuberculosis.

3. Diet in atherosclerosis and hypertension.

4. Diet in ulcer, diarrhea and constipation.

5. Diet in diabetes mellitus with and without insulin.

NUTRITION THROUGH LIFE CYCLE PRACTICAL

1. Menu planning and food exchange list.

2. Nutritional and food requirements to meet the needs of the following.

    a. Infant and Children

    b. School children

    c. Adolescent

    d. Adult

    e. Old people

3. Nutritional and food requirements to meet the physiological conditions of

    a. Pregnancy.

    b. Lactation .

CORE PRACTICAL - IV

A. FOOD SERVICE MANAGEMENT

1. Visit to well-organized food service units

Hostel, hotel, restaurant, Industry, hospital Transport.

2. Table setting and service-appraising and drawing silver cutlery and crockery Folding of Napkins - Laying of table cloth, table mats - Arrangement of cover and table - appointment according to the menu - serving food at the table clearing of the table.

3. Standardization of any 3 selected quantity recipes and their preparation. Calculation of nutritive value, cost per serving - size of serving.

4. Quantity Cookery: Preparation of South Indian, North Indian and Western menu for 25 members.

5. Organizing, preparing and serving of one special meals for 50 members.

B. DIETETICS - II

Planning and preparing of diets for the following conditions / stages.

1. Diet in obesity and underweight.
2. Diet in hepatitis and cirrhosis of liver.
3. Diet in Nephritis and Nephrosis.
4. Diet in Cancer.
5. Dietary internship program for a month.

INTERNAL ELECTIVE

PAPER - 2

FOOD STANDARDS AND QUALITY CONTROL

COURSE OBJECTIVES

To enable the students to:

- Study the government regulation in quality control.
- Enable to classify food standards.
- Know about the consumer protection Act.
- Ability to design the company quality Assurance program.
- Knowledge to describefood hazards and food adulteration.

UNIT - I

Quality Control: Objectives, Importance, functions of quality control, stages of quality control in food industry.Food Quality Assurance: Design of company quality assurance program, Microbiological concerns.Managing quality in supply chain and marketing of food products.

UNIT-II

Government Regulations In Quality Control: FAO/WHO codex Alimentarious commission, PFA, AGMARK, BIS, FPO, fair average quality (FAQ) specification for food grains, ISO 9000 series.HACCP: Background, current status, structured approach, principles, benefits and limitation.Consumer Protection Act (CPA)

UNIT-III

Food Standards: Cereals and products - bread, biscuits, cakes products.Food

Packaging: Food packaging and labelling various methods. Recent trends in Packaging and labelling.Fruits Products: Jam, juices, squashes, ketchup, sauce.Oils and Fats: Coconut oil, groundnut oil, palm oil, sunflower oil, vanaspati.Milk and Products: Skimmed milk powder, partly skimmed milk powder, condensed sweetened milk.Other products - coffee, tea, sugar, honey, toffees.

UNIT-IV

Food Safety: Meaning of food safety. Importance of Food Quality and safety fordevelopingcountries.Patent: Definition, requirements, patent law in India, administrator, need for patent system, advantages, precautions to be taken by applicants, patent procedures, non-patentable.

UNIT-V

Food Hazards: Physical, Chemical, Biological hazards associated with food types. Effect of processing and storage on microbial safety.Food Adulterator: Adulteration of food - common adulterants and tests detect common adulterants.

Course Outcomes

- Understand the specification and standards for different products
- Comprehend the knowledge gained on food laws and food safety regulations at regional and national level
- Monitor and evaluate food laws and standards in food service industry
- Acquire knowledge on food hazards and food adulteration

References

1. Sivasankar, B. (2013) Food Processing and preservation 2nd edition, prentice Hall, Pvt, Ltd.
2. Srilakshmi, N., Food Science, New Age International Private Ltd., New Delhi, 2002.

3. Swaminathan, M., Food Science, Chemistry and Experimental Foods, Bappco Publishers, Bangalore, 2014.
4. Chandrasekhar, U, Food Science and Applications in Indian Cookery, Phoenix Publishing House Private Ltd., New Delhi, 2012..
5. Sommers, C.H. and Xveteng Fan, Food Irradiation Research and Technology, Blackwell Publishing, 2016.

INTERNAL ELECTIVE

PAPER - 3

NUTRACEUTICALS AND NUTRIGENOMICS

COURSE OBJECTIVES

To enable the students to:

- Learn to define Nutraceuticals and nutrigenomics.
  Understand the role of dietary supplements and nutraceuticals in health and disease.
- Knowledge to classify the probiotics and prebiotics.
- Aquire knowledge for the application of nutrigenomics in health and disease.

UNIT - I

Definition of functional and traditional foods, nutraceuticals, designer foods and pharma foods, history of functional foods, components of functional foods, foods containing nutraceuticals and classification of nutraceuticals - based on plant sources, mechanism of action and chemical nature

UNIT - II

Concept of dietary supplements, sources and functions of phytochemicals with suitable examples, FOSHU foods - concepts, regulatory aspects

UNIT - III

Human gastrointestinal tract and its microbiota, functions, concept of probiotic, prebiotics and symbiotics; applications of probiotics in human nutrition

UNIT - IV

Definition of nutrigenomics, gene expression - transcription, translation, post translational modification, nutrition in the omics era- elementary concepts on epigenetics, transcriptomics, proteomics, metabolomics; genetic variation and nutritional implications

UNIT - V

Nutrient control of gene expression - amino acids, nucleotides, basic concepts of nutrigenomics and complex diseases - diabetes, cancer and obesity

Course Outcome

- Understand the developments in the field of nutraceuticals and nutrigenomics
- Comprehend the components of functional foods and foods containing of \ nutraceuticals
- Know the importance of probiotics and prebiotics in human health
- Understanding the effects of nutrients in molecular level in the body and the effect of pytochemicals in disease in disease conditions
- Articulate and advocate the principle of nutrigenomics in controlling life style disease

References

1. Mahtab, S, Bamji, Kamala Krishnasamy, G.N.V. Brahmam, Text Book of Human Nutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi, 2009.
2. Srilakshmi, B. Second Edition, Food Science, New Age International (P) Limited Publishers, New Delhi, 2010.
3. Simopoulus, A.P. and Ordovas, K.J.M., 2004, Nutrigenetics and Nutrigenomics,

   Vol. 93, Karger, Switzerland.
4. Watson, David, H., 2003, Performance Functional Foods, CRC Press, Wood Head Publishing Ltd., England

   Narasinga Rao, B.S., 2005, Nutrition Research in India - A Country Report, Published by INSA, New Delhi.

5. Webb, G.P., 2006, Dietary Supplementations and Functional Foods, Blackwell Publishing Ltd., New York.

SKILL BASED SUBJECT IV

PAPER - 4

PERSPECTIVES OF HOME SCIENCE

COURSE OBJECTIVES

To enable the students to:

- Understand the concept and scope of Home science and its components.
- Explain the job opportunities in home science.
- Create new design in home science.
- Outline balanced diet for various age group.
- Describe human development.

UNIT - I

Meaning of Home Science Education- Philosophy of Home and Family- Components of Home Science-Carrier Perspectives- Its Relation to other Disciplines- Science and Humanities. The Home Science Association of India- History and Objectives, Achievements of the Association- Representation in National Bodies

UNIT - II

Concept of Interior Design-Importance of Good Taste, Components of an Artistic Interior- Resource Classification, Methods of Conserving Energy, Importance and Type of Goals, Values- Types, Value to be Imbibed by Youth - Fiber-Classification: Nature. Synthetic, Yarn-Definition, Types- Ply, Cable, Novelty, Fabric: Construction Method- Weaving Basic Steps, Knitting and its Importance, Nonwovens and Types, Clothing: Origin, Clothing Theory, Selection of Clothing, Clothing Budget, Laundering and Storing-Cotton, Wool, Silk and Delicate Fabrics - Basic concepts of Home management and steps - Basic Characteristics of Resources, Decision making, Work simplification.

UNIT - III

Meaning, Definition, Objectives, Philosophy, Principles of Extension Education, Extension as the Third Dimension of Higher Education, Home Science Extension Service at Various Levels- Village, Block and District Level, Role of Home Science Extension in Rural And National Development- Welfare Programme- National, Social Assistance Programme (NSAP) - Member of Parliament Local Area Development Scheme (MPLADS), Member of Legislative Assembly Area Development Scheme (MLAADS), Rajiv Gandhi Rehabilitation Package (RGAP), Mahatma Gandhi National Rural Employment Scheme (MNRES)

UNIT - IV

Conception-Pre Natal Development, Pre and Post Natal Care, Growth and Development during Childhood and Adolescence, Characteristics of Adulthood, Characteristics and Problems of Elderly and Emerging Trends in Parenting.

UNIT - V

Classification of Foods according to Function and Origin, Food Groups- Balanced Diet- Meaning and Importance of Balanced Diet, Meal Planning, Macro and Micro Nutrients of Foods- Introduction of Dietetics- Principles of Diet Therapy - Aims, Objectives and Classification of Commercial and Non Commercial Food Service- Operations and Functioning of Commercial and Non Commercial Food Service, Indian Cuisines and their Features, Setting up a Cover and Simple Service.

Course Outcomes

- Identify good design , list their goals and values, set their standards
- Enlist the principles of diet therapy and functioning of food service institution
- Comprehend the key aspects of human growth and development and realize the importance of mastering developmental tasks of each life span stage
- Understand the concept of extension education and its importance

References

- Jaliha, K.A and Veerabhadran , V. 2007, Fundamentals of extension education and management in extension , concept publishing company, New Delhi.
- Premalatha, M., 2007, Text book of Home Science, Kalyani Publishers, Chennai

- Pundit, N, 2007, Text book of Fashion Technology- Today, Tomorrow, Mittal publication, New Delhi
- Parker, R. Introduction to food Science, Delmer, Thomson Learning Co., Delma, 2000
- Potter, N. and Hotchkiss, J.H. Food Science, 5th Ed., CBS Publications and Distributors, Daryaganji, New Delhi, 1998

****