DEPARTMENT OF HOME SCIENCE

S.V.U. COLLEGE OF SCIENCES

SRI VENKATESWARA UNIVERSITY: TIRUPATI

M.Sc. HOME SCIENCE – FOOD SCIENCE NUTRITION AND DIETETICS

(REGULAR) PROGRAMME

Restructured P.G. Programme (CBCS) As Per NEP 2020,

National Higher Education Qualification Frame Work (NHEQF) and Guidelines of APSCHE

To Be Implemented With Effect from the Academic

YEAR 2024-2025

SYLLABUS

Choice Based Credit System (CBCS)

DEPARTMENT VISION

To be a premiere centre for excellence in higher education in the areas of specialization fostering nurturing and building careers for students and to be an apex body playing a pivotal role in planning and monitoring community development.

DEPARTMENT MISSION

The Department of Home Science is committed to empower the students in capacity building skills through teaching, research and community-oriented extension activities, there by widening the scope for self-development and Employability and preparing them as socially useful and responsible citizens.

The academic programmes, research and extension activities are planned and executed meticulously so as to reflect the vision and mission of the Department, focusing on the empowerment of students through quality education by updating syllabus with current trends and providing appropriate knowledge and skills compete at the global level. The Department through motivated staff always strives towards reaching proficiency through teaching and community-oriented extension programmes.

DEPARTMENT OBJECTIVES

1. Enable the students to understand the interrelation of Food and Health.
2. To foster knowledge across the life span in inter connected Human Development factors to become efficient counselors and early childhood educators.
3. Develop sensitivity towards the community problems and train the students in Extension and outreach activities.
4. To focus on training students in application of techniques to process and preserve the food.

The department of Home Science has been adopting the systematic procedure for development, revision and implementation of the curriculum for four different post-graduate programmes offered viz., **Food Science Nutrition and Dietetics (FSND), Human Development and Child Welfare (HDCW), Extension Management and Communication Technology (EMCT)and Food Technology (FT)**. The learning outcomes of each course are framed such that they help students to gain theoretical knowledge as well as skills to meet local, national and global trends. The curriculum of each course has practical, field visits, visit to institutions and a mandatory internship programme, which focus on imparting essential skills and hands-on experience and experiential learning thereby can excel when they get employment in Government and Non-Government Organizations to work individually as well as in teams. The cross-cutting issues namely, technology, gender, child rights, human values and professional ethics are incorporated in core theories and electives to enable the students to lead a purposeful and independent life filled with moral and ethical values. Majority of the courses offered across all programmes do focus on nurturing employability/entrepreneurship/skill development. The outcomes of each programme have the emphasis on commitment and contribution to the interest of the society as a whole and perform well in their careers.

M.Sc. FOOD SCIENCE NUTRITION AND DIETETICS

M.Sc. – FOOD SCIENCE NUTRITION AND DIETETICS

PROGRAMME OBJECTIVES:

1. To provide human resource in the field of Food Science, Nutrition and dietetics to cater the needs of the Community at local, regional and National levels.
2. To give skill and hands on experience in the thrust areas of the programme and prepare students for research.
3. To give training both in theory and practical for higher studies and competitive exams.
4. To facilitate by giving quality education for employability, entrepreneurship and skill development.
5. To inculcate the corporate social responsibility by profession and personal development there by developing the community by various curriculum and co curricular activities.
6. To conduct field studies, Internship and project work as part of curriculum for developing data base for interventions and further studies and help policy makers to improve the health status of the population in the community.

Programme Educational Objectives (PEO): To enable students to:

1. Understand the relationships between Food Science, Nutrition and Metabolism.
2. Gain knowledge on fundamental science involved in Food science, food processing and preservation, food quality, developing diet plans for different age groups and disease conditions.
3. Acquire skills in applying knowledge of Food science, Nutrition, and therapeutic nutrition in community and human health.
4. Interpret nutritional research through informed knowledge of food science, nutrition and diet therapy in community and health.

Program Outcomes: After successful completion of the program, the student is able to:

S. No	Program Outcomes
PO1	Apply knowledge in Food science nutrition and dietetics to understand the chemical components- nutrients and non-nutrient constituents their physico chemical and functional properties, spoilage, processing, preservation, packaging of different foods. To assess nutritional status of individuals in various life-cycle stages and determine nutrition-related problems and diseases by applying knowledge of metabolism and nutrient functions, food sources, and physiologic systems in community, hospital, and in any situations.
PO2	Identify and understand different problems related to food science, food microbiology, food adulteration and nutritional problems in different stages of life in health and disease- its consequences and dietary management and apply knowledge

	to tackle these problems.
PO3	Design food products applying the principles of food science and nutrition to meet the challenges of nutritional problems.
PO4	Conduct research in different fields of nutrition using human and animal models, designing new food products, food service establishments.
PO5	Apply appropriate techniques to design, process, preserve, analyze and authenticate the different components of foods and food products.
PO6	Function effectively in different facets as dietitian, quality control systems, food analysts, research and development, food product designing, different food service establishments, and policymaking
PO7	Communicate effectively Nutrition information in person and with community. Acquire skills in writing research report, documentation, case studies, seminar presentations, group discussions, and marketing strategies.
PO8	Describe social and environmental dimensions within nutrition and the life sciences. Able to demonstrate the National and International food laws, regulations and safety standards in application of food additives to ensure safe food.
PO9	Know Professional and social ethics as researcher, dietitian, community mentor, food business operator.
PO10	Apply knowledge of Nutrition and food science for sustainable development of the society in terms of socio cultural aspects, attitudes, and practice balanced diet in health and disease, food quality and safety regulations, food adulteration, food safety and hygiene.
PO11	Develop and design their own food business plan in terms of food business operators and food service establishments.
PO12	Learn new concepts of Nutrition science in global perspective and prepare them for lifelong learning process.

SEMESTER-I

SI.No	Components of Course	Code	Title of the Course	Hrs/ Week	No. of Credits	SEE	IA	Total Marks
1	CC	HSFS -101	Community Nutrition	4	4	70	30	100
2		HSFS -102	**A-**Food Science and Experimental Foods	4	3	50	25	75
			B-Dynamics in Food Preparation					
3		HSFS -103	**A-**Food Microbiology and Safety	4	3	50	25	75
			B-Food Hygiene and Sanitation					
4	P	HSFS 104	**Practical -I(102+103)**	6	2	35	15	50
5	SOC	HSFS -105	**A-**Food chemistry and Analysis	4	3	50	25	75
			B-Food Additives and Adulteration					
6		HSFS -106	**A-**Bakery & Confectionary Technology	4	3	50	25	75
			B-Beverage Technology					
7	P	HSFS -107	**Practical-II (105+106)**	6	2	35	15	50
			Total	36	20	340	160	500
8	Audit Course	HSFS -108	Indian Knowledge systems-1	4	0	0	100	0

SEMESTER-II

SI.No	Components of Course	Code	Title of the Course	Hrs / Week	No. of Credits	SEE	IA	Total
1	CC	HSFS -201	Research Methodology in Biosciences	4	4	70	30	100
2		HSFS -202	**A-**Food Processing and Preservation Technology	4	3	50	25	75
			B-Fermentation Technology					
3		HSFS -203	**A-**Food Packaging	4	3	50	25	75
			B-Therapeutic Nutrition					
4	P	HSFS -204	**Practical -III(202+203)**	6	2	35	15	50
5	SOC	HSFS -205	**A-**Food Safety and Quality Control	4	3	50	25	75
			B-Food Laws and Regulations					
6		HSFS -206	**A-**Food Product Development and Commercialization	4	3	50	25	75
			B-Food Wastage Management					
7	P	HSFS -207	**Practical-IV (205+206)**	6	2	35	15	50
8	OOTC	HSFS -208	Open Online Transdisciplinary Course-1	-	2	-	100	100
			Total	36	22	340	260	600
9	Audit Course	HSFS -209	Indian Knowledge systems-2	4	0	0	100	0

SEMESTER-III

SI.No	Components of	Code	Title of the Course	Hrs/ Week	No. of	SEE	IA	Total

	Course				Credits			
1	**CC**	HSFS -301	Institutional Food Service Management	**4**	**4**	**70**	**30**	**100**
2		HSFS -302	**A-**Nutritional Biochemistry	**4**	**3**	**50**	**25**	**75**
			B-Nutrition during Life Span					
3		HSFS -303	**A-**Advances in Human Nutrition	**4**	**3**	**50**	**25**	**75**
			B-Geriatric Nutrition					
4	**P**	HSFS -304	**Practical -V(302+303)**	**6**	**2**	**35**	**15**	**50**
5	**SOC**	HSFS -305	**A-**Clinical Nutrition & Dietetics	**4**	**3**	**50**	**25**	**75**
			B-Nutritional Assessment Techniques					
6		HSFS -306	**A-**Nutrition for Health and Fitness	**4**	**3**	**50**	**25**	**75**
			B-Sports Nutrition					
7	**P**	HSFS -307	**Practical-VI (305+306)**	**6**	**2**	**35**	**15**	**50**
8	**OOTC**	HSFS -308	Open Online Transdisciplinary Course-2	**-**	**2**	**-**	**100**	**100**
*	Seminar/Tutorial/Remedial classes and Quiz as part of Internal assessment			**4**	**-**	**-**	**-**	**-**
Total				**36**	**20**	**340**	**260**	**600**

SEMESTER-IV

SI.No	Components of Course	Code	Title of the Course	Hrs/ Week	No. of Credits	SEE	IA	Total
1.	**OOSDC**	HSFS -401	Open Online Skill Development Courses	-	8	-	200	200
2.	**PW**	HSFS -402	Project Work-Orientation Classes	24	12	300	0	300
*	Conducting classes for competitive exam, communication skills, UGC/CSIR and NET examinations			12	-	-	-	-
Total				**36**	**20**	**300**	**200**	**500**
TOTAL SEMESTERS				**144**	**84**	**1320**	**880**	**2200**

SEMESTER -I

SRI VENKATESWARA UNIVERSITY::COLLEGE OF SCIENCES
DEPARTMENT OF HOME SCIENCE
CHOICE BASED CREDIT SYSTEM (C.B.C.S) SYLLABUS AS PER NEP 2020

WITH EFFECT FROM THE ACADEMIC YEAR 2024-2025 onwards
FOOD SCIENCE NUTRITION & DIETETICS (HSFS)

SEMESTER-I

SI.No	Components of Course	Code	Title of the Course	Hrs/ Week	No. of Credits	SEE	IA	Total Marks
1	**CC**	HSFS -101	Community Nutrition	**4**	**4**	**70**	**30**	**100**
2		HSFS -102	**A-**Food Science and Experimental Foods	**4**	**3**	**50**	**25**	**75**
			B-Dynamics in Food Preparation					
3		HSFS -103	**A-**Food Microbiology and Safety	**4**	**3**	**50**	**25**	**75**
			B-Food Hygiene and Sanitation					
4	**P**	HSFS 104	**Practical -I(102+103)**	**6**	**2**	**35**	**15**	**50**
5	**SOC**	HSFS -105	**A-**Food chemistry and Analysis	**4**	**3**	**50**	**25**	**75**
			B-Food Additives and Adulteration					
6		HSFS -106	**A-**Bakery & Confectionary Technology	**4**	**3**	**50**	**25**	**75**
			B-Beverage Technology					
7	**P**	HSFS -107	**Practical-II (105+106)**	**6**	**2**	**35**	**15**	**50**
			Total	**36**	**20**	**340**	**160**	**500**
8	**Audit Course**	HSFS -108	Indian Knowledge systems-1	**4**	**0**	**0**	**100**	**0**

CORE COURSE

HSFS - 101: COMMUNITY NUTRITION

Common to all specializations of M.Sc Home Science –
Food Science Nutrition and Dietetics (HSFS), Human Development and Child Welfare (HSHD), Extension Management and Communication Technology (HSEM) and MS Food Technology (FTE)

Course Objectives- To enable the students to:

1. Know about composition of the food and their functions.
2. Understand the consequences of deficiency of taking nutrients.
3. Apply skills for planning diets for nutritional disorders.
4. Apply the techniques to plan menus for different socio economic groups.

THEORY

UNIT-I: Concept of Community Nutrition

- Definition of Health, Nutrition and Community Nutrition-Factors Affecting Community Nutrition and Health- Food habits
- Nutritive values of different foods, Functions of foods and nutrients – cereal grains, millets, pulses, nuts and oil seeds fruits and vegetables, milk and milk products, meat, egg, poultry and fish, spices and condiments.
- Nutritional requirements-Recommended Dietary Allowances-Balanced diet-Menu planning for different socio economic groups

UNIT – II: Nutrition in Life Cycle

- Pregnancy - Physiological changes-Complications - Nutritional Requirements
- Lactation-Physiological changes- Nutritional Requirements
- Infancy-Growth and Development-Breast Feeding-Composition of Human Milk-Nutritional Requirements- Weaning and Supplementary Foods
- Preschool and School going children –Importance of nutrition- Nutritional requirements - Nutrition related problems in children.
- Adolescents and Adults: Physiological changes- Nutritional Requirements- Nutritional problems: Eating disorders- Nutrition in Adult hood period on the basis of gender& activities
- Elderly: Physiological changes-Nutritional requirements- Problems during old age

UNIT – III: Major Nutritional Problems of the Community

- Protein Energy Mal-nutrition: Types of Malnutrition, Ecology of malnutrition-environmental, social, and economical factors. Classification of PEM- causes, signs and symptoms, Treatment and Preventive measures.
- Common Nutritional Deficiencies in the Community
  Etiology - Signs and Symptoms-Prevention and Control of-
  -Vitamin A deficiency-
  -Iron deficiency (anaemia)
  -Iodine deficiency

UNIT – IV: Strategies to resolve common nutritional problems

- Food Fortification-Food Supplementation and Enrichment.
- Government Policies and Programmes - Integrated Child Development Services (ICDS)-Balawadi Nutrition Programme (BNP)- Targeted Public Distribution System (TPDS) - Food For Work (FFW). Nutition Programmes- Special Nutrition Programme (SNP), PradhanMantriPoshan Shakti Nirman (PM POSHAN)-Scheme for Adolescent Girls (SAG).
- Pophylaxis Programmes-Vitamin A- Anaemia-Iodine.

REFERENCES

1. Suryatapa Das (2023) "*Textbook of Community Nutrition"* (2023), 6th Edition, Academic Publishers, Kolkata.
2. Gopalan, C. (1992). *Basic issues in combating malnutrition*- NFI Publication.
3. Gopalan, C. (1990). *Women nutrition in India*. NFI Publication.
4. Jelliffe, D.B.(1966).*Assessment of nutritional status of the community*, WHO Monograph, Series No. 53. WHO Geneva
5. Mehtab S. Bamji. (1996).*Text book of human nutrition*, Oxford & IBH Co.PVT.LTD, New Delhi,.
6. Seymour L. HarpenM.D.(1979).*Quick reference to clinical nutrition* Suitor, C.W. and Hunter, M.F. (1980).*Nutrition principles and application in health promotion*, J.B. Lippincot Company, Philadelphia
7. Swaminathan, M. (1990). *Essentials of food and nutrition*, Vol. I and Vol. II Ganesh and co. Madras

Course Out comes: After completion of this course, students will be able to

CO 1 Know about the nutritional problems of the community.
CO 2 Acquire knowledge about food groups, RDA and steps in planning a diet.
CO3 Skills in planning and calculating nutritive values for different nutritional disorders.
CO4 Apply the techniques to plan menus for different socio economic groups

CO-PO Mapping

Cours	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**		**2**			**2**					**2**		
CO2	**3**	**3**	**3**	**2**			**3**					**2**		
CO3	**3**	**3**	**3**	**2**					**2**			**2**		
CO4	**3**	**3**	**3**	**2**			**3**		**2**			**2**		

High-1, Medium-2, Low-3

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI

M.Sc Home Science Degree Examination
First Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)
HSFS -101: COMMUNITY NUTRITION

Time: **Max Marks: 70**

SECTION- A 4x5=20Marks

Answer any FOUR of the Following
Each question carries 5 marks

1.

2.

3.

4.

5.

6.

7.

8.

SECTION- B 4x12.5 =50 Marks

Answer ALL questions
Each Question carries 12.5 Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

CORE COURSE

HSFS: 102-A: FOOD SCIENCE AND EXPERIMENTAL FOODS

(Common to M.Sc. Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives - To enable the students to:

1. Acquire knowledge on Plant and Animal foods composition, processing and preservation of nutritive values.
2. Understand the principles of cookery of different foods and methods of evaluation.
3. Learn about different processing techniques on nutritive quality of foods.
4. Apply skills in standardization of foods using different processing techniques.

THEORY

UNIT-I: Cereals and Pulses

- Cereals and Millets: Structure, Composition and functional properties.
- Starch: Characteristics, Gelatinization, Factors affecting gelatinization, modified food starches-Applications.
- Pulses and Legumes: Composition, anti-nutritional factors, Effect of cooking.

UNIT-II: Fruits, Vegetables and Spices and Condiments

- Vegetables: Classification, Composition, Pigments and Flavors constituents - Cooking effect.
- Fruits: Classification, Composition, Pigments, Flavors constituents and Browning reactions.
- Spices and Condiments: Significance, Classification, composition and its role in foods.

UNIT-III: Sugars, Fats, Nuts and Oil seeds

- Sugars: Types of sugars and sugar syrups, Crystallization of sugars, Sugar cookery and applications.
- Fats and oils: Sources, Composition, Absorption, Functional properties of fat- Melting point, Smoke point and flash point.
- Nuts and Oil seeds: Classification, Nutritive value and toxic constituents**.**

UNIT-IV: Foods of Animal Origin

- Milk: Composition, Kinds of milk and Functional properties of Milk.
- Egg: Structure, composition and Functional properties of eggs.
- Meat and Poultry: Structure, Muscle composition, Heat-induced changes in meat, Tenderness – Tenderizers.
- Fish and Marine foods: Classification, Selection, Composition and cooking.

PRACTICALS:

1. Cereals and Pulses: Starch cookery- Gelatinization and Pulse cookery- Effect of cooking on pulses.
2. Vegetable and Fruits: Vegetables- Effect of time, temperature, media and cooking methods on pigments & Fruits- Enzymatic Browning - preventive measures.
3. Sugars and Fats: Fats-Smoke points, oil absorption and mayonnaise preparation & Sugar cookery- Stages of sugar cookery and its applications.
4. Milk and Egg cookery: Milk- factors affecting milk cookery-Temperature, pH, acid, base, and coagulation factor & Egg- Egg white foams, methods of cooking egg.
5. Meat and Fish cookery: Meat-role of tenderizers in meat cooking & Fish-Methods of cooking fish.

REFERENCES

1. Vaclavik, V. A., Christian, E. W., & Campbell, T. (2008). *Essentials of food science* (Vol. 42). New York: Springer.
2. Srilakshmi, B. (2003). *Food science*. New Age International.
3. Khader, V. (2019). *Text book of food science and technology*. Indian council of agricultural research.
4. Belle Lowe.(1998).*Experimental Cookery*, John Wiely& Sons, INC, New York.
5. Sethi Mohini.(2011).*Food Science: Experiments and Application*, second edition, Jain book Agency, New Delhi.
6. N.ShakuntulaManay& M. Shadaksharswamy. (2001).*Foods- Facts and Principles*, second edition, New Age International Publishers, New Delhi.
7. Norman N Potter.(2007).*Food Science*, Fifth edition, An Aspen Publication, Mariland.

Course Outcomes - After the completion of the course, the students will be able to:

CO 1. Acquire knowledge on the functional properties of Plant and Animal foods.

CO 2. Standardization of product by using accurate methods.

CO 3. Demonstrate the role of ingredients in cookery.

CO 4. Application of different techniques in evaluation of foods.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**											**3**	**3**	**3**
CO2	**3**		**3**		**3**		**3**		**3**		**2**	**3**	**3**	**3**
CO3	**3**	**2**	**3**	**2**	**3**					**2**		**3**	**3**	**3**
CO4	**3**	**2**	**3**	**1**	**3**	**2**	**3**		**3**		**2**	**3**	**3**	**3**

High-3, Medium-2, Low-1

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
First Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)
HSFS –102-A: FOOD SCIENCE AND EXPERIMENTAL FOODS

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks
Answer any FIVE of the Following
Each question carries 2 marks

1.
2.
3.
4.
5.
6.
7.
8.

S ECTION- B 4x10=40 Marks
Answer ALL questions
Each Question carries 10Marks

9. (a).
(or)
(b).

10. (a).
(or)
(b).

11. (a).
(or)
(b).

12. (a).
(or)
(b).

CORE COURSE

HSFS: 102-B: DYNAMICS IN FOOD PREPARATION

(Common to M.Sc. Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives - To enable the students to:

1. Learn the principles of safe food preparation and food pyramid.
2. Understand the role of foods in cookery.
3. Apply knowledge about effect of cooking on nutrients.
4. Estimate the effects of cooking on Nutrients.

THEORY

UNIT-I: Introduction

- Definition, Composition and Functions of food science.
- Food pyramid and Principles of safe food preparation.
- Food as source of physical sustenance, food as religious symbol.
- Importance of food in understanding human culture - variability, diversity, from basic ingredients to food preparation.

UNIT-II: Cooking Methods and Equipments

- Principles and objectives of Cooking.
- Cooking methods - roasting, broiling, steaming, boiling, pressure cooking, poaching, frying, stewing, braising, pot roasting, baking.
- Types of cooking equipments- weighing balances, Grill, Boiler, Oven and Microwave.
- Mechanical processing equipments- Vegetable Peeler, Chopper, Mixer, Slicing machine and mincing equipment.

UNIT-III: Safety and Storage of food handling

- Safety and sanitation-Principles of sanitation and personal hygiene;
- Equipment use and care - heating equipments, refrigerator, juicers, mixing and grinding devices, gas range, steamers; water filters.
- Basic safety measures for safe working.
- Principles of safe storage: safe holding temperature for foods;
- Sanitary refrigeration, safe cooling and reheating of foods; safe techniques for knife skills and hand tools.

UNIT-IV: Role of Ingredients in Cookery

- Role of cereals, pulses, fats/oils, milk and milk products, flesh foods, sugars, vegetables, fruits and spices in cookery.
- Application of ingredients and specialty ingredients in food preparations.
- Appropriate Selection of foods based on the nutrient composition and seasonal availability.
- Basic elements of presentation - garnishing; tools for garnishing and Plating of recipes.

PRACTICALS:

1. Standardization of weights and measures.
2. Standardization of portion sizes.
3. Methods of cooking.
4. Usage of various cooking equipments and its applications.
5. Preparation of various recipes.

REFERENCES

1. Srilakshmi,B.(2001).*Food Science*, 2nd edition New Age International (P) Ltd., Publishers, Bangalore, Chennai & Hyderabad.
2. Swaminathan, M.(1979).*Food science and Experimental foods*. Ganesh & Co., Madras.
3. Dr.M Swami Nathan. (2010). Food and Nutrition Volume-2 Second Edition the Bangalore Printing and Publishing Co Ltd Bangalore 560018.
4. Shubhangini A.Joshi. (2010). Nutrition and Dietetics Third Edition Tata Mecgraw Hill Education Private Limited New Delhi.

Course Out comes – After completion of the course, students will able:

CO1 Acquire knowledge on Food Pyramid.
CO2 Identify role of foods on Cookery.
CO3 Gain knowledge on methods of Cooking.
CO4 Estimate the effects of cooking on Nutrients.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**											**3**	**3**	**3**
CO2	**3**		**3**		**3**		**3**		**3**		**2**	**3**	**3**	**3**
CO3	**3**	**2**	**3**	**2**	**3**					**2**		**3**	**3**	**3**
CO4	**3**	**2**	**3**	**1**	**3**	**2**	**3**		**3**		**2**	**3**	**3**	**3**

High-3, Medium-2, Low-1

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
First Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 102-B: DYNAMICS IN FOOD PREPARATION

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

CORE COURSE

HSFS: 103-A: FOOD MICROBIOLOGY AND SAFETY

(Common to M.Sc. Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives - To enable the students to:

1. Obtain knowledge about important genera of microorganisms associated with food.
2. Acquaint food contaminants and their sources.
3. Understand the various factors associated with growth, food spoilage and food-borne diseases of different microorganisms.
4. Demonstrate the use of standard methods and procedures for the microbiological analysis of food.

THEORY

UNIT-I: Introduction to Food Microbiology

- Significance and role of pathogenic and beneficial microorganisms in food.
- Classification, morphological characteristics and nutritional requirements of microorganisms.
- Factors affecting growth of microorganisms, growth curve.

UNIT-II: Food Spoilage and Contamination

- General principles underlying spoilage: causes of spoilage and changes caused by microorganisms.
- Sources of contamination and types of spoilages among plant origin foods:
    - Cereals, Legumes, nuts and oil seeds
    - Fruits and Vegetable products
    - Spices and condiments

UNIT-III: Food Contamination and Spoilage of Animal origin and Processed Foods

- Sources of contamination and types of spoilages among :
    - Milk and Milk products
    - Eggs, poultry and Meat
    - Fish and Other sea foods
    - Sugars and sugar products
    - Processed foods

UNIT-IV: Food Borne Diseases and Food Safety

- Food borne diseases – Food Infections and Intoxication. Signs and symptoms of various Bacterial Food-borne poisoning and Non-bacterial food-borne poisoning.
- Food safety: concept, factors affecting food safety, biological hazards.
- Application of Microbiology in food industry.

PRACTICALS:

1. Laboratory safety rules and precautions.
2. Sterilization methods, Isolation techniques and Microbial Staining Techniques.
3. Media preparation and Microbial examination of food and food products.
4. Microbial examination of food products: Identification, isolation and confirmation
5. Detection of pathogenic organisms in foods and viable count.

REFERENCES

1. William.C.Frazier and Denni, S.C. Westhoff. (2004). *Food Microbiology*, 4th edition, Tata MCGraw-Hill publishing company Ltd, New Delhi.
2. James,M.Jay.(2005). Modern *Food Microbiology*, 4th edition, CBS publishers and Distributors, New Delhi.
3. Adams,M.R. and Moss,M.O.(2003). *Food Microbiology*, Second edition, Panima Publishing Corporation, New Delhi.
4. Jay, J. M., Loessner, M. J., & Golden, D. A. (2008). *Modern food microbiology*. Springer Science & Business Media.
5. Banwart, G. (2012). *Basic food microbiology*. Springer Science & Business Media.
6. Matthews, K. R., Kniel, K. E., & Montville, T. J. (2017). *Food microbiology: an introduction*. John Wiley & Sons.

Course Outcomes - After the completion of the course, the students will be able to:

CO1 Identify the important genera and factors associated with food spoilage.

CO2 Elucidate the food contaminants in different types of food commodities.

CO3 Describe the characteristics of food borne diseases, infections and intoxications and their identification.

CO4 Demonstrate the use of standard methods and procedures for the microbiological analysis of food.

CO-PO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**									**3**	**3**	**3**	**3**
CO2	**3**	**3**		**2**							**2**	**3**	**3**	**3**
CO3	**3**	**3**										**3**	**3**	**3**
CO4	**3**	**3**			**2**			**2**			**3**	**3**	**3**	**3**

High-3, Medium-2, Low-1

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
First Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 103-A: FOOD MICROBIOLOGY AND SAFETY

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

CORE COURSE

HSFS- 103-B: FOOD HYGIENE AND SANITATION

(Common to M.Sc. Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives - To enable the students to:

1. Know about concept of food hygiene, and importance of safe food and its storage.
2. Acquaint the students with importance of sanitation and health.
3. Design food hygiene and sanitation measures.
4. Control Measures to avoid microbial contamination.

THEORY

UNIT-I: Hygiene and Sanitation

- General principle of food hygiene.
- Personal hygiene and food handling habits.
- Sanitation in food Processing areas, sanitary aspects of building and equipment.
- Plant layout and design.

UNIT-II: Sanitation practices

- Hygiene and Sanitation in Food Service Institutions. Cleaning and disinfection Personal hygiene, Waste disposal.
- Source of water, quality of water, water supply and its uses in food processing units.
- Establishing and maintaining sanitary practices in food industry, sanitation principle and the requirements for a food sanitation program, role of sanitization, general sanitary consideration and sanitary evaluation of food plants.

UNIT-III: Pest Control

- Safe and effective insect and pest control: Extraneous materials in foods, Principles of Insects and pest's control.
- Physical and chemical methods of control.
- Effective control of micro-organisms: microorganisms important in food sanitation, microorganisms as indicator of sanitary quality.
- Special requirements for high-risk foods. Safe food cooking temperature and storage techniques

UNIT-IV: Cleaning Practices

- Cleaning practices: Effective detergency and cleaning practices: Importance of cleaning technology, physical and chemical factors in cleaning, classification and formulation of detergents and sanitizers, cleaning practices.
- Methods of disposal of solid waste, liquid and gaseous waste, wet and dry cleaning-COP, CIP.

PRACTICALS:

1. Principles of hygiene and sanitation in food units.
2. Assessment of personal hygiene.
3. Assessment of surface sanitation by swab and rinse method.
4. Analysis of Water by MPN method.
5. Detection of pathogens in food using conventional microbiological tests.

REFERENCES:

1. Fellows P et al. Making Safe Food: A Guide to Safe Food Handling and Packaging for Smallscale Producers Practical. Action Publishing, 1998.
2. Frazier WC and West off DC. Food Microbiology, TMH, New Delhi, 2004.
3. IFST. Food Hygiene Training: A Guide to its Responsible Management, UK: Institute of Food Science and Technology 1992.
4. Lawley R, Curtis L and Davis J. The Food Safety Hazard Guidebook, RSC. 1. Publishing, 2004.
5. Manay NS and Shadakshasaswamy M. Food Facts and Principles, New Age. International, 2004.
6. Marriott NG and Gravani RB. "Principles of Food Sanitation", New York: Springer, 2006.

Course Outcomes - After the completion of the course, the students will be able to:

CO1 Acquire skills in food handling, solid and liquid waste management and disposal.
CO2 Perform techniques related to food hygiene.
CO3 Skills in personal hygiene and environmental hygiene
CO4 Knowledge on CIP and COP techniques and its usages in different areas.

CO-PO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1		3									3	3	3	3
CO2		3	3	2							2	3	3	3
CO3	3	3										3	3	3
CO4	3	3	3		2			2			3	3	3	3

High-3, Medium-2, Low-1

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
First Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS- 103-B: FOOD HYGIENE AND SANITATION

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

HSFT -104 :PRACTICAL-I (102+103)

HSFS -102: A-Food Science and Experimental Foods

(OR)

B-Dynamics in Food Preparation

+

HSFS -103: A-Food Microbiology and Safety

(OR)

B-Food Hygiene and Sanitation

SKILL ORIENTED COURSE

HSFS: 105-A: FOOD CHEMISTRY AND ANALYSIS

(Common to M.Sc. Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives -To enable the students to:

1. Acquire knowledge on chemical composition of different foods.
2. Understand the physical, chemical, and functional properties of foods.
3. Know the principles and working applications of different analytical techniques associated with food.
4. Perform skills in qualitative and quantitative estimation of nutrients in different foods.

THEORY

UNIT-I: Water Chemistry and Dispersed Systems

- Water chemistry – Structure of Water, Free, Bound and Entrapped Water.
- Water Activity and Relative Vapour pressure– Definition and measurement, factors affecting water activity, Moisture sorption isotherms, Hysteresis and Moisture Determination.
- Dispersions- Food as dispersed systems, Liquid dispersions.
- Colloids- Definition, Characteristics of Colloids, Gels, Emulsions, Foams.

UNIT-II: Carbohydrates and Lipids

- Carbohydrates – Classification , Structure, Physico – Chemical properties of Monosaccharide's-Pentoses, and Hexoses,
- Oligosaccharides – Di Saccharides-Maltose, Lactose, Sucrose –Crystallisation of sugars, Polysaccharides – Starch-Amylose and Amylopectin- Gelatinisation of starches and Hydrolysis of starch, Cellulose and Pectin- Structure and properties.
- Lipids – Nomenclature, classification – Milk fats, Animal fats, Vegetable fats.
- Physical properties – Crystallization, Plasticity
- Chemical properties – Thermal decomposition, Chemistry of Frying, Hydrogenation, Inter esterification, Rancidity of fats.

UNIT-III: Proteins and Amino Acids

- Proteins and amino acids – Classification, Structure, Physical properties.
- Functional properties –
    - Protein Denaturation, Protein hydration, Solubility,
    - Interfacial properties,
    - Emulsification and foaming, Gelation,
    - Dough formation.

UNIT-IV: Food Analysis

- Introduction to food analysis- Methods of sampling, Determination of Total ash, Principles and methods of chemical analysis
- Carbohydrates – Qualitative and Quantitative analysis of starch and sugars.
- Proteins – Electrophoresis, Micro-Kjeldahl method.
- Fats – Analysis of solid and liquid fats, Rancidity.

- Determination of Vitamin and Minerals – Vitamin-C, Iron, Phosphorus, Calcium.
- Basic principles and applications of spectroscopy- UV, UV- visible, AAS, AES.
- Chromatography- principles and applications of Chromatography- HPLC, GC/ MS and LC/ MS.

PRACTICALS:

1. Determination of Moisture – direct and indirect method
2. Determination of Starch and Sugars
3. Estimation of proteins - Micro-Kjeldahl method
4. Qualitative and quantitative analysis of fats and oils –Soxhlet method.
5. Determination of vitamins and minerals – Vitamin C, Ash –Iron, Phosphorus

REFERENCES

1. Lillian Hoagland Meyer. (2019).Food Chemistry", First Edition, CBS publishers and Distributors, New Delhi.
2. Fennema R. (2019). Food Chemistry. Marcel Dekker Inc. New York.
3. Ranganna S. (2019). Handbook of analysis and quality control for fruits and vegetables, 2nd edition. Tata McGraw Hill.
4. Nielsen S.S. (2002). Introduction to the chemical analysis of foods, CBS Publishers and Distributers, Pvt. Ltd.

Course Outcomes -After completion of this course, students will be able to:

CO1 Acquire knowledge on the physico chemical properties of compounds in foods.
CO2 Apply the functional properties of foods in processing and preservation.
CO3 Perform skills in qualitative and quantitative estimation of nutrients in different foods.
CO4 Describe the chemical components and their functions in Food applications.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
CO1	3	3			2	2							3	
CO2	3	3			2	3							3	
CO3	3				3	3		1				1		3
CO4	3				2	2		1				1		3

3-High, 2- Medium, 1- Low

SKILL ORIENTED COURSE

HSFS: 105-B: FOOD ADDITIVES AND ADULTERATION

(Common to M.Sc. Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives- To enable the students to:

1. Familiarize the students with food additives concerning safe food production in accordance with national and international systems that ensure food quality and safety.
2. Aware the students with the use of different types of food additives, classification, biological status and legal limits according to the international and national food safety regulations.
3. Aware about the national and international regulations related to the food additives and their safety.
4. Understand the various food adulteration practices and study possible risk factors associated with food adulteration.

THEORY

UNIT-I: Introduction to food additives

- Food additives- definitions, classification according to the EU &US food laws.
- Additives applications and risk factors in food processing and preservation.
- Food additives for the preservation of foods-Natural additives, synthetic additives.
- Consumer attitude towards food additives.

UNIT-II: Different types of food additives & Applications

- Coloring agents, Flavoring agents, Flavor enhancers, Sweeteners, Anti-browning agents, Antioxidants, Antimicrobial agents, pH control & acidulants, Emulsifiers, Enzymes, Commercial starches, Food phosphates.
- Fat substitutes & replacers.
- Sugar substitutes & replacers.
- Additives for special dietary uses.
- Nutritional additives.
- Essential fatty acids as food additives.

UNIT-III: International regulations of food additives

- Nomenclature; International standards for safe use of food additives.
- Codex Alimentarius general standards for food additives.
- Codex General Standard for Food Additives (GSFA) Online Database.
- Food additives in the European Union.
- Food additives in the United States.
- FSSAI regulations on the use of food additives**.**

UNIT-IV: Food adulteration and detection

- Introduction, types of adulteration, impact of adulteration on health.
- Classification of food adulteration.
- Common food adulterants.
- Adulterant authentication in food materials- Physical authentication techniques,

authentication by biochemical and analytical methods.

- Adulteration remedy strategies.

PRACTICALS:

1. Processing and preservation of food by different kinds of food additives.
2. Application of sugar replacers in various food products.
3. Application of fat replacers in various food products.
4. Identification of various food color adulteration.
5. Identification of ghee adulteration.

REFERENCES

1. Branen, A. L., Davidson, P. M., Salminen, S., & Thorngate, J. (Eds.). (2001). *Food additives*. CRC Press.
2. Smith, J., & Hong-Shum, L. (2011). *Food additives data book*. John Wiley & Sons.
3. Saltmarsh, M., & Saltmarsh, M. (Eds.). (2013). *Essential guide to food additives*. Royal Society of Chemistry.
4. Smith, J. (Ed.). (1991). *Food additive user's handbook*. Glasgow: Blackie.
5. Baines, D., & Seal, R. (Eds.). (2012). *Natural food additives, ingredients and flavourings*. Elsevier.
6. Sen, M. (2021). Food chemistry: role of additives, preservatives, and adulteration. *Food chemistry: the role of additives, preservatives and adulteration*, 1-42.

Course Out comes- After completion of this course, students will be able to:

CO1 Acquire knowledge on food additives and their applications.

CO2 Use of food additives and their classification according to the various international regulations.

CO3 Understand the national and international regulations to control food additives use.

CO4 Understand the various food adulteration practices and their detection mechanisms.

CO-PO Mapping

Cours	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO1	PO1	PO1	PSO	PSO
CO1	**3**	**3**		**3**			**2**					**3**		
CO2	**3**	**3**	**3**	**2**			**3**					**2**		
CO3	**3**	**3**	**3**	**3**					**2**			**3**		
CO4	**3**	**3**	**3**	**3**			**3**		**3**			**3**		

High-3, Medium-2, Low-1

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
First Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 105-B: FOOD ADDITIVES AND ADULTERATION

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

SKILL ORIENTED COURSE

HSFS: 106-A: BAKERY AND CONFECTIONARY TECHNOLOGY

(Common to M.Sc. Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives: To enable the students to:

- To acquaint students with the principles and role of ingredient in bakery
- To familiarize students with processing techniques, quality parameters, and nutritional comparisons of baked products.
- To learn about the various ingredients used in confectionery product.
- To study the technology & ingredients involved in production of confectionery product.

THEORY

UNIT-I: Science and Technology of Bakery

- Introduction, Types, Principles of bakery.
- Ingredients, enzymes, Additives, leavening agents and their role in Bakery products.
- Science and Technology of Baking process.
- Dough Rheology.

UNIT-II: Science and Technology of Confectionery

- Introduction, Types, Principles of Confectionery.
- Ingredients, Sweeteners, syrups, enzymes, Additives, and their role in confectionery products.
- Science and Technology of confectionery process.
- Crystallization.

UNIT-III: Process and Manufacturing of bakery and Confectionery Products

- Formulations, Methods of dough making, process and Manufacture of Breads.
- Process and Manufacture of cakes, cookies and other bakery products.
- Formulations, process and Manufacture of Sugar confectionery.
- Formulations, process and Manufacture of Chocolate confectionery.
- Health and Specialty bakery and Confectionery Products.

UNIT-IV: Standards and specifications of bakery and Confectionery Products

- Quality control of ingredients, additives and products of bakery.
- Quality control of ingredients, additives and products of Confectionary.
- FSSAI standards and specifications for bakery and confectionary products.

PRACTICALS:

1. Process and Preparation of bread and cakes.
2. Process and Preparation of cookies, Biscuits and other bakery products.
3. Process and Preparation Sugar confectionary.
4. Process and Preparation chocolate confectionary.
5. Process and Preparation Healthy bakery and confectionary products.

REFERENCES:

1. Dubey SC. 2002. Basic Baking. The Society of Indian Bakers, New Delhi.
2. Francis FJ. 2000. Wiley Encyclopedia of Food Science & Technology. John Wiley & Sons.
3. Manley D. 2000. Technology of Biscuits, Crackers & Cookies. Second Edition. CRC Press. Pyler EJ. Bakery Science & Technology. Third Edition. Vols. I, II. Sosland Publ.
4. Qarooni J. 1996. Flat Bread Technology. Chapman & Hall.

Course Outcomes:

CO1. The student will gain an understanding of processing techniques utilized in the bakery and confectionery industry

CO2. The student will comprehend the role of convenience food technology as an important aspect of commercial foods.

CO3.Perform skills in qualitative and quantitative estimation of nutrients in different foods.
CO4. Prepare various food products including bakery and confectionary.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2										2	3	
CO2	3	2										1	3	
CO3	3		3									1		3
CO4	3			2	2							2		3

3-High, 2- Medium, 1- Low

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
First Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 106-A: BAKERY AND CONFECTIONARY TECHNOLOGY

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

SKILL ORIENTED COURSE

HSFS: 106-B: BEVERAGE TECHNOLOGY

(Common to M.Sc. Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives-To enable the students to:

- Acquaint with the particulars of manufacturing industrial beverages.
- Familiarize with the quality requirements of bottled beverages.
- Get an overview on various techniques/methods in beverage technology.
- Equip with skills required for process and preserve various food products.

THEORY

UNIT-I: Introduction

- History and Status of Beverage Industry in India and globally.
- Classification and types of beverages.
- Beverage Ingredients and their Functions – sweeteners, bulking agents, acidulants, flavorings, preservatives.
- Role of enzymes and clarifying agents in beverage industry.

UNIT-II: Water

- Packaged Drinking Water – Manufacturing Process, Raw and Processed Water, and Water Treatment.
- Types of Bottled Water – Mineral Water, Spring Water, Flavored Water, Carbonated Water.
- Quality Standards of Bottled and Packaged Water.

UNIT-III: Carbonated and Non-Carbonated Beverages

- Carbonated Beverages - ingredients, processing techniques, and standards.
- Fruit- and Vegetable-based Beverages – ingredients, processing techniques, and standards.
- Synthetic Beverages - ingredients, processing techniques, and standards.
- Indigenous Beverages for Domestic and Commercial Use – sugarcane juice, cashew apple extract, coconut palm sap.
- Beverages used in the Sports Industry – types, ingredients, processing techniques, and standards

UNIT-IV: Alcoholic Beverages

- Distillation and Distilled Liquors – whisky, rum, gin, vodka, brandy.
- Fermentation and Fermented Alcohols – wine, ciders, sake.
- Carbonated Alcohols – beer, champagne.
- Indigenous Alcohol Production – urak, feni, toddy.

PRACTICALS:

1. Quality analysis of raw water.
2. Determination of brix value, pH and acidity of beverages.
3. Preparation of synthetic beverage.
4. Preparation of carbonated and non-carbonated beverages.
5. Visit to carbonation unit or mineral water plant.

REFERENCES:

1. Hui YH et al 2004. Handbook of Food and Beverage Fermentation Technology. Marcel Dekker.
2. Priest FG & Stewart GG. 2006. Handbook of Brewing. Second Edition. CRC.
3. Richard P Vine. 1981. Commercial Wine Making - Processing and Controls. AVI Publishing.
4. Varnam AH and Sutherland JP. 1994. Beverages: Technology, Chemistry and Microbiology.
5. Chapman & Hall. Woodroof JG and Phillips GF.1974. Beverages: Carbonated and NonCarbonated. AVI Publishing.

Course Outcomes:

CO1. Understand the processing techniques used in the beverage industry.

CO2. Comprehend the role of ingredients on beverage manufacture.

CO3. Apply appropriate technologies to process and preserve the beverages.

CO4. Gain knowledge on standards and specifications of beverages.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**											**3**	**3**	**3**
CO2	**3**		**3**		**3**		**3**		**3**		**2**	**3**	**3**	**3**
CO3	**3**	**2**	**3**	**2**	**3**					**2**		**3**	**3**	**3**
CO4	**3**	**2**	**3**	**1**	**3**	**2**	**3**		**3**		**2**	**3**	**3**	**3**

High-3, Medium-2, Low-1

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
First Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 106-B: BEVERAGE TECHNOLOGY

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

HSFS- 107: PRACTICAL-II: (105+106)

HSFS: 105: A-Food chemistry and Analysis

(OR)

B-Food Additives and Adulteration

+

HSFS: 106: A-Bakery & Confectionary Technology

(OR)

B-Beverage Technology

HSFS-108: INDIAN KNOWLEDGE SYSTEMS-1

SEMESTER-II

DEPARTMENT OF HOME SCIENCE
CHOICE BASED CREDIT SYSTEM (C.B.C.S) SYLLABUS AS PER NEP 2020
WITH EFFECT FROM THE ACADEMIC YEAR 2024-2025 onwards
FOOD SCIENCE NUTRITION & DIETETICS (HSFS)

SEMESTER-II

Sl.No	Components of Course	Code	Title of the Course	Hrs / Week	No. of Credits	SEE	IA	Total
1	**CC**	HSFS -201	Research Methodology in Biosciences	**4**	**4**	**70**	**30**	**100**
2		HSFS -202	**A-**Food Processing and Preservation Technology	**4**	**3**	**50**	**25**	**75**
			B-Fermentation Technology					
3		HSFS -203	**A-**Food Packaging	**4**	**3**	**50**	**25**	**75**
			B-Therapeutic Nutrition					
4	**P**	HSFS -204	**Practical -III(202+203)**	**6**	**2**	**35**	**15**	**50**
5	**SOC**	HSFS -205	**A-**Food Safety and Quality Control	**4**	**3**	**50**	**25**	**75**
			B-Food Laws and Regulations					
6		HSFS -206	**A-**Food Product Development and Commercialization	**4**	**3**	**50**	**25**	**75**
			B-Food Wastage Management					
7	**P**	HSFS -207	**Practical-IV (205+206)**	**6**	**2**	**35**	**15**	**50**
8	**OOTC**	HSFS -208	Open Online Transdisciplinary Course-1	**-**	**2**	**-**	**100**	**100**
			Total	**36**	**22**	**340**	**260**	**600**
9	**Audit Course**	HSFS -209	Indian Knowledge systems-2	**4**	**0**	**0**	**100**	**0**

CORE COURSE

HSFS: 201: RESEARCH METHODOLOGY IN BIOSCIENCES

(Common to M.Sc. Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives- To enable the students to:

1. Know the basic principles of research.
2. Study the various concepts involved in scientific drafting and writing process.
3. Study the various elements in biostatistics applied in the science and technology.
4. Study the various techniques and methods involved in the food quality evaluation.

THEORY

UNIT- I: **An Insight into Research**

- Definition, meaning and Objectives of research.
- Significance of research, Scientific Methods and research approaches.
- Characteristics of good research.
- Criteria of good research.
- Types of Research- Quantitative and Qualitative, Descriptive and Analytical, Applied and Fundamental, Primary and Secondary, Exploratory and Conclusive.

UNIT-II: Research Process in Nutrition and Food Technology

- Research design: definition, purpose, characteristics of good research design.
- Sampling & Estimating Population Sampling: Representation Sample; Sample Bias; Sampling Techniques (Simple Random, Systematic, Stratified, Multistage, Cluster and Multiphase). Sampling Distribution.
- Design of experiments; Policies in regulating research in Nutrition and Food Technology.
- Guidelines for use of Humans, Animals, Plants and Herbs in research.
- Analytical techniques: Demographic, Diet and Nutritional, biological, clinical, biochemical, Toxicologial and shelf life studies.

UNIT-III: Research Process and Design

- Research process-Steps and Phases
- Research problem: definition, identification and evaluation of the problem.
- Formulation of hypothesis: definition, nature and functions of hypothesis, importance of hypothesis, forms of hypothesis.
- Variables and tools - types.
- Data collection techniques
- Research writing-Background, Review, Materials and Methods, Results and Interpretation and Bibliography.
- Research integrity, publication ethics and authorships.

UNIT-IV: Statistical Tools for the Analysis of Research Data

- Introduction and definition statistics and parameters.
- Descriptive statistics: mean, median, mode, range, variance, standard deviation, histograms, box plots.
- Hypothesis testing: z-test, t-tests
- Regression analysis: simple linear, multiple and logistic regression.
- Analysis of variance (ANOVA): one way and two way ANOVA.
- Estimating Population Parameters: Testing of Hypothesis (Type I and Type II Errors, Level Of Significance); Paired & Unpaired T-Test for Testing Population Mean (S) & Proportion (S); Analysis of variance (ANOVA & ANCOVA).
    - Non-Parametric Tests - Chi – Square Test.

- Analysis using data packages and Data software-Applications- Resources.
- SPSS: Data entry; analysis and interpretation.
- Graph pad: Data entry; analysis and interpretation.

REFERENCES

1. Goh, K. M. (2023). Research Methodology in Bioscience and Biotechnology. Springer.
2. Pandey, P., & Pandey, M. M. (2021). *Research methodology tools and techniques*. Bridge Center.
3. Mishra, S. B., & Alok, S. (2011). Handbook of research methodology.
4. Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.
5. Gupta, S. (2002). *Research methodology and statistical techniques*. Deep and Deep Publications.

Course Outcomes - After the completion of the course, the students will able to:

CO1 Understand the basic principles of research.
CO2 Understand the various concepts involved in scientific drafting and writing process.
CO3 Learn the various elements in biostatistics applied in the science and technology.
CO4 Understand various techniques and methods involved in the food quality evaluation.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO1	2	3		3	3							3	3	2
CO2	2			2	3							2	2	2
CO3	2	2	3	2	3	2			2	3		2	2	2
CO4	3	3		3	3	3		2	2		3	2	3	3

High- 3, Medium- 2, Low- 1

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Second Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 201: RESEARCH METHODOLOGY IN BIOSCIENCES

Time: **Max Marks: 70**

SECTION- A 4x5=20Marks

Answer any FOUR of the Following
Each question carries 5 marks

1.

2.

3.

4.

5.

6.

7.

8.

SECTION- B 4x12.5 =50 Marks

Answer ALL questions
Each Question carries 12.5 Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

CORE COURSE

HSFS: 202-A: FOOD PROCESSING AND PRESERVATION TECHNOLOGY

(Common to M.Sc. Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives - To enable the students to:

1. Understand the principles and scope of food processing and preservation.
2. Get an overview on various techniques/methods in food processing and preservation.
3. Acquire knowledge of emerging technologies and their applications in food processing and preservation.
4. Equip with skills required for process and preserve various food products.

THEORY

UNIT-I: Food Processing and Preservation – An Introduction

- Need, Purpose, Principles and Methods of food processing and preservation.
- Traditional Methods of food processing and preservation.
- Natural and Chemical Food Preservatives – types, permissible limits, safety aspects

UNIT-II: Preservation by High Temperatures

- Principles of thermal processing and its effect on quality of foods.
- Blanching, Canning, Retard, Extrusion, Pasteurization, UHT processing, Thermal Sterilization.
- Drying and Dehydration -Types, Methods and their suitability for different food products.
- Concentration – Types, Methods and their suitability for different food products.

UNIT-III: Preservation by Low Temperatures

- Principles of low temperature processing and its effect on quality of foods.
- Refrigeration, Freezing, Lyophilisation, Cryogenic Freezing, Dehydro-freezing, Freeze Concentration, IQF.

UNIT-IV: Advanced Food Processing Technologies

- Irradiation, High Pressure Processing, Pulse Electric Field, Microwave processing.
- Edible Coatings and Films, Nano technology, Hurdle Technology, Modified Atmosphere.

PRACTICALS:

1. Preservation of foods by traditional methods- Salt, Sugar and Spices.
2. Drying and dehydration of foods - Assessment of quality.
3. Refrigeration and Freezing of foods - Assessment of quality.
4. Preservation of foods with edible coatings and dips.
5. Visits to different commercial food processing units and Industries.

REFERENCES

1. Fellows,P. and Ellis,H. (1990). *Food Processing Technology: Principles andPractice,*New York.
2. ShafiurRahman, (2011), Hand book of food preservation, CRC Press, Newyork.
3. Harry. W. Von Loesecke.(1998). *Drying and dehydration of Foods*, Allied Scientific,NewDelhi.
4. Jelen,P.(1985). *Introduction to Food Processing*, Prentice Hall, Reston Virginia, USA.
5. Norman, N. Potter, Joseph H. Hotchkiss.(1996). *Food Science*, 5th edition, CBS Publishers &Distributors, New Delhi.
6. Rama swamy,H. and Marcote,M. (2005). *Food processing- principals and applications*,CRC Press, Newyork

Course Outcomes - After the completion of the course, the students will be able to:

CO1 Conceptualize principles of traditional and novel food processing and preservation technology.
CO2 Understand the applications and limitations of food processing and preservation technology.
CO3 Comprehend the functions and applications of food preservatives and additives.
CO4 Apply appropriate technologies to process and preserve the foods to extend their shelf life.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**				**3**						**2**	**3**	**3**	**3**
CO2	**3**	**2**			**3**			**1**			**2**	**3**	**3**	**3**
CO3	**3**			**2**	**3**			**3**	**3**	**2**	**3**	**3**	**3**	**3**
CO4	**3**		**3**	**3**	**3**	**2**		**3**	**3**		**3**	**3**	**3**	**3**

High-3, Medium-2, Low-1

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Second Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 202-A: FOOD PROCESSING AND PRESERVATION TECHNOLOGY

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

CORE COURSE

HSFS: 202-B: FERMENTATION TECHNOLOGY

(Common to M.Sc. Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives- To enable the students to:

- Gain knowledge about fermentation technologies used in food industry,
- Learn role of microorganisms in fermentation
- Gain skills to control of fermentation processes.
- Acquire knowledge types of fermentors, equipments & instruments used in fermentation.

THEORY

UNIT-I: Introduction

- Introduction to Fermentation technology, basic principles of food fermentation
- Status and role of fermentation in food industry.
- Definition, types, Benefits and Limitations of fermentation Technology.
- Role of ingredients used in fermentation Technology.
- Major types of organisms used in fermentation.

UNIT-II: Basic Concepts of Fermentation

- Fermenter design - parts & their functions
- Types of fermenter - batch, Continuous, Dual and Multiple
- Design of fermentation media- water, carbon and nitrogen source, Growth factors, precursors, aeration and antifoam agents.
- Factors affecting fermentation process.
- Control of fermentation – requirements for control, design of a fermentation control systems, sensors and controllers, control of incubation, aeration and agitation

UNIT-III: Types of cultures

- Microbial cultures in food fermentation and their maintenance.
- Types of cultures and its applications in food products.
- Bioreactors – types and designs.
- Probiotics, Prebiotics and symbiotics.
- Preservation of Industrially important microorganisms

UNIT-IV: Preservation by Fermentation

- Cereal and pulse based fermented foods.
- Fruits and Vegetables based fermented foods.
- Meat based fermented foods.
- Milk and Beverages based fermented foods.

PRACTICALS:

1. Study on effect of agitation on microbial growth in batch fermentation.
2. Estimation of Lactic acid Production.
3. Estimation of Alcohol Production.
4. Preparation of traditionally fermented food: Sauerkraut.
5. Preparation of fermented products.

REFERENCES:

1. Emt.el-Mansi & CFA. Bryce Fermentation Microbiology & Biotechnology, Taylor & Francis Ltd.(2004)
2. Stanbury, P.F., A. Whitaker & S.J. Hall. Principles of fermentation technology Oxford Press.(1997).
3. Peter F Stanbury, Allan Whitaker, Stephen J Hall. Principles of Fermentation Technology. (2016) Butterworth-Heinemann Press. UK.

Course Outcomes:

CO1. The students learn role of microorganism in fermentation.
CO2. The students learn fermentation types.
CO3. Learn production technologies for different types of fermented food products.
CO4. Acquire knowledge on types of cultures and its applications.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**											**3**	**3**	**3**
CO2	**3**		**3**		**3**		**3**		**3**		**2**	**3**	**3**	**3**
CO3	**3**	**2**	**3**	**2**	**3**					**2**		**3**	**3**	**3**
CO4	**3**	**2**	**3**	**1**	**3**	**2**	**3**		**3**		**2**	**3**	**3**	**3**

High-3, Medium-2, Low-1

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Second Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 202-B: FERMENTATION TECHNOLOGY

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

CORE COURSE

HSFS: 203-A: FOOD PACKAGING

(Common to M.Sc. Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objective- To enable the students to:

1. Provide knowledge on packaging and packaging materials
2. An overview of the scientific and technical aspects of food packaging.
3. Enable the students to understand the regulations of packaging and packaging material testing.
4. Apply the new innovations in food packaging to improve product stability and/or to extend the product shelf-life.

THEORY

UNIT- I: Introduction of Packaging Materials

- Introduction, Principles and Functions of Packaging
- Type of packaging materials: Paper and Paperboard, Plastics and thermos foams, Glass, Metals and composite laminates-Tetra pack
- Primary, Secondary, Tertiary packaging materials; Packaging equipment;

Unit-II: Food and Packaging:

- Selection of packaging material for different foods.
- Packaging-Food Interactions**:** Flavor absorption, Migration, Permeation, Sorption; Nutrient loss, Role of the food matrix, Role of differing packaging materials.
- Factors effecting the food packaging interactions- Composition of packaging material, Properties of food material, storage conditions.

Unit-III: Graphics and Packaging Design

- Introduction, Packaging and modern merchandising.
- Functions of packaging graphics: Brand identity, Product information and Communication, labeling protocols and standards.
- Packaging Design: Importance, Packaging Structure, Convenience, Functional Features, Brand Representation, Sustainability and Impact on consumer attraction.

UNIT- II: Advanced Food Packaging System

- Active and Intelligent Packaging Techniques**:** Active packaging technology, intelligent packaging technology, Consumers perception towards novel packaging systems.
- Aseptic Packaging Technology**-** Introduction, Technology, Applications, advantages and disadvantages, Suitable packaging materials.
- Packaging for high Pressure Processing- Introduction, Technology, Applications, Advantages and Dis advantages, Suitable packaging materials.

- Modified/Controlled Atmosphere Packaging technology (MAP/CAP)- Introduction, Technology, Applications, advantages and disadvantages, Suitable packaging materials.

PRACTICALS:

1. Classification of various packages based on material and rigidity.
2. Measurement of thickness of packaging materials.
3. Measurement of basic weight and grammage of paper and paperboards.
4. Measurement of water absorption of paper and paper boards (Cobb Test).
5. Measurement of grease resistance of papers.

REFERENCES

1. Emblem, A. (Ed.). (2012). *Packaging technology: Fundamentals, materials and processes*. Elsevier.
2. Piergiovanni, L., & Limbo, S. (2016). *Food packaging materials* (pp. 33-49). Basel, Switzerland:: Springer.
3. Yam, K. L. (Ed.). (2010). *The Wiley encyclopedia of packaging technology*. John Wiley & Sons.
4. Paine, F. A., & Paine, H. Y. (2012). *A handbook of food packaging*. Springer Science & Business Media.
5. Han, J. H. (Ed.). (2005). *Innovations in food packaging*. Elsevier.
6. Athavale, S. P. (2018). *Hand Book of Printing, Packaging and Lamination: Packaging Technology*. Notion Press.

Course Outcomes- After the completion of the course, the students will able to:

CO1 Exposure about packaging, packaging materials and packaging methods.
CO2 Comprehend the overview of the scientific and technical aspects of food packaging
CO3 Acquire knowledge on regulations of packaging and testing.
CO4 Able to utilize some of the new innovations in food packaging to improve product stability and/or to extend the product shelf-life.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**		**1**									**3**	**3**	**3**
CO2	**3**		**1**					**2**			**1**	**3**	**3**	**3**
CO3	**3**		**1**					**3**			**3**	**3**	**3**	**3**
CO4		**3**	**3**		**2**			**2**	**2**	**2**	**3**	**3**	**3**	**3**

High- 3, Medium- 2, Low- 1

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Second Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 203-A: FOOD PACKAGING

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

CORE COURSE

HSFS: 203-B: THERAPEUTIC NUTRITION

(Common to M.Sc. Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives -To enable the students to:

1. Understand the concepts of Therapeutic nutrition, its relation to health.
2. Describe the role and responsibilities of Dietitian in Hospital.
3. Apply Knowledge related to Therapeutic modification of diets and diet planning.
4. Plan and prepare diet for different diseases conditions.

THEORY

UNIT- I: Therapeutic Nutrition and Nutrition Care Process

- Dietician and Nutritionist, types, role and responsibilities of dietician, IDA.
- Therapeutic Nutrition, Principles in planning therapeutic diets, Therapeutic modifications of the normal diets.
- Progressive diets: Routine/Regular hospital diets, Liquid diets, Soft diets
- Special feeding methods: Enteral and Parenteral Nutrition, Types, methods and formulation of feedings.
- Food exchange systems.
- Nutrition Care Process (NCP) and Diet Counselling

UNIT -II: Dietary Management in Metabolic Disorders

- Diabetes Mellitus: classification, Etiology, symptoms, Diagnosis, complications, Glycemic index and load, Dietary management of Diabetics, hypoglycemia.
- Overweight and Obesity: Classification, Etiology, assessment, factors affecting weight gain, Consequences. Management of Obesity- Dietary and Lifestyle Modifications.

UNIT -III: Dietary Management in Gastrointestinal and Hepato-Bilary Tract Disorders

- Diseases of the Upper Gastro intestine - Gastro Esophageal Reflux Disease (GERD), Esophagitis, Hiatal Hernia.
- Diseases of the Stomach: Gastritis, Peptic Ulcer, Dumping syndrome.
- Diseases of intestine: Celiac disease, Inflammatory bowel disease, , Irritable bowel syndrome, Short bowel syndrome
- Disorders of liver: Hepatitis, Hepatic Steatosis, Cirrhosis, Hepatic encephalopathy.
- Gallbladder Disorders**:** Chollelithiasis, Cholecystitis.

- Disorder of pancreas: pancreatitis.

UNIT-IV: **Dietary Management in Cardiovascular and Renal Disorders**

- Cardiovascular Disorders - Atherosclerosis, Coronary Heart disease (CHD), Hypertension (HT), Angina pectoris, myocardial infraction (MI), Rheumatic Heart Disease (RHD).
- Renal Disorders-Nephrotic syndrome, glomerular nephritis, Nephrolithiasis, urinary tract infection.

PRACTICALS:

1. Planning and preparation of diets for the types of Diabetes
2. Planning and preparation of diets for weight management
3. Planning and preparation of diets for Gastrointestinal and Liver disorders
4. Planning and preparation of diets for Cardio Vascular disorders
5. Planning and preparation of diets for Renal disorders

REFFERENCES

1. Whitney NE, Cataldo BC, Rolses RS. (1987). Understanding Normal and Clinical Nutrition" West Pub.Company. St Paul, New Yok, Los Angeles, San Fransisco.
2. Mahan, L.K. and Escott-Stump, S. (2000): Krause's Food Nutrition and Dietherapy, 10th Edition, W.B. Saunders Ltd.
3. Shils, M.E., Olson, J.A., Shike, M. and Ross, A.C. (1999): Modern Nutrition inHealth and Disease, 9th Edition, Williams and Wilkins.
4. Williams, S.R. (1993): Nutrition and Diet Therapy, 7th Edition, Times Mirror/MosbyCollege Publishing.
5. Davidl. Katzwolters Kluwer/LippinCottWilliams and Wilkins. (2007). Nutrition in Clinical Practice, Second Edition.

Course Outcomes - After completion of this course, students will be able to:

CO1 Apply the concepts of Therapeutic nutrition in different diseases.
CO2 Modification of the diets appropriate to the patients in different diseases.
CO3 Planning and preparation of diets for different disease conditions.
CO4 Able to provide Diet counselling.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PS
CO1	3	3	3	2								2	3	3
CO2	3	3	3	2								2	3	3
CO3	3	3	3	3						2		1	3	3
CO4	3	3	3	3		3	3		2	2		1	3	3

3-High, 2- Medium, 1- Low

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Second Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 203-B: THERAPEUTIC NUTRITION

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.
2.
3.
4.
5.
6.
7.
8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

HSFS-204: PRACTICAL-III: (202+203)

HSFS-202: A-Food Processing and Preservation Technology

(OR)

B-Fermentation Technology

+

HSFS-203: A-Food Packaging

(OR)

B-Therapeutic Nutrition

SKILL ORIENTED COURSE
HSFS: 205-A: FOOD SAFETY AND QUALITY CONTROL
(Common to M.Sc Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives -To enable the students to:

1. Understand the current food safety standards rules and regulations.
2. Gain knowledge on desirable and undesirable constituents and contaminants in foods.
3. Critically explains on subjective and objective methods.
4. Develop skills for quality analysis and quality assurance of food quality

THEORY

UNIT-I: **Food Quality, Assessment and evaluation.**

- Definition and Physico Chemical attributes.
- Subjective methods; Sensory/ Organoleptic evaluation-Difference, Preference and Scoring tests.
- Objective methods of evaluation.
- Chemical methods of evaluation.
- Microbial methods of evaluation.

UNIT-II: Food quality Standards

- Food Safety Standards Authority of India (FSSAI)- Rules and Regulations- Food products Standards and additive regulations, Prohibition and sales regulations, Packaging and Labelling regulations, Alchoholic beverages Regulations, Fortification food regulations, Food / Health supplements and Nutraceutical regulations and Organic food regulations.
- Food Licensing and Registration system
- International Food Safety Standards- ISO, CODEX, HACCP- Principles.

UNIT-III: Food Contaminants

- Food contaminants- Definition, Classification- Physical, Chemical, Biological Contaminants
- Unintentional /Undesirable constituents-Naturally occurring contaminants, Heavy metals, pesticide residues, products of microbial growth, Health hazarads.

- Intentional/ Desirable constituents-chelating agents, acids, bases, buffer systems and salts; stabilizers, thickners, polyhydrocalcinols, anticaking, firming, clarifying and bleaching agents; antioxidants, non- nutritional sweeteness, antimicrobial agents, Gases and propellants.

UNIT-IV: Food contaminants and Standards of Quality

- Contaminants and quality standards in Milk and Milk products
- Contaminants and quality standards Fruit and Vegetable products
- Contaminants and quality standards Meat, Poultry, Eggs and Fish
- Contaminants and quality standards Fats and Oils

PRACTICALS:

Assessment of quality parameters and adulterants in different foods

1. Cereals, Pulses and Flours – Label information, detection of adulterants
2. Fats and oils – Label information, Adulterant tests, Iodine number and FFA Value
3. Fruit and vegetable products – Label information, Acidity , TSS, Sugars
4. Coffee and Tea, Honey – Label information, Detection of Adulterants
5. Milk and milk products- Label information, COB test, Acidity, MBRT, Detection of adulterants.

REFERENCES

1. VanishaNambiar. (2004). A Text book on "Food Contamination and Safety " ANMOL Publications Pvt.Ltd. New Delhi .
2. S.N.Mahindru . (2004). Food Safety –Concept and Reality, APH Publishing corporation, Ansari road ,Darya ganj, New Delhi.
3. Rajesh Mehta and J.George . (2005). Food Safety Regulation concerns and Trade –The developing country perspective ,Mac millan India Ltd.
4. Amerine, M.A.,Pangborrn RM, and Roessler BB. (1965). Principles of Sensory evaluation of foods", Academic press New York.
5. The prevention of food adulteration Act, 1954 and Prevention of food adulteration Rules, 1955. (1998). Federation of Indian Industry, New Delhi.
6. Norman N. Potter, Joseph H. Hotchkiss (1996) "Food Science" 5th Edition.CBS Publishers and Distributors, New Delhi.
7. https://www.fssai.gov.in

Course Outcomes - After the completion of the course, the students will be able to:

CO1 Gain knowledge in current rules and regulations of food safety standards and quality assurance.

CO2 Identify the contaminants and additives in foods.

CO3 Select the appropriate analytical technique when presented with a problem.

CO4 Demonstrate practical proficiency in a food quality analysis.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

CO1	3	3						3				3	3	
CO2	3	3						3				3	3	
CO3	3	2		1	3	1		3				3		3
CO4	3	2		1	3	1		3				3		3

3-High, 2- Medium, 1- Low

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Second Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 205-A: FOOD SAFETY AND QUALITY CONTROL

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.
2.
3.
4.
5.
6.
7.
8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

SKILL ORIENTED COURSE

HSFS: 205-B: FOOD LAWS AND REGULATIONS

(Common to M.Sc. Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives-To enable the students to:

- To gain the knowledge with regard to the importance of Food Safety.
- To familiarize students with national and international laws governing food production, import and export.
- To analyze the safety operations involved in food system.
- To know the HACCP standards in different food industries.

THEORY

UNIT – I: Introduction

- Introduction to concepts of food quality, food safety, food quality assurance and food quality management;
- Objectives, importance and functions of quality control

UNIT – II: National and International Regulatory Agencies

- Role of national and international regulatory agencies, Bureau of Indian Standards (BIS), AGMARK, Food Safety and Standards Authority of India (FSSAI)
- International Food Standards- WHO- FAO-Codex Alimentarius Commission-ISO-Principles, Rules and Regulations
- International organization for standards (ISO) and its standards for food quality and safety (ISO 9000 series, ISO 22000, ISO 15161, ISO 14000)

UNIT – III: Quality Management

- HACCP; Quality manuals, documentation and audits; Export import policy, export documentation
- Total Quality Management; GMP & GHP; GLP, GAP; Sanitary practices
- Laboratory quality procedures and assessment of laboratory performance; Applications in different food industries

UNIT – IV: Adulterants and Containments

- Food adulteration: Definition, common adulteration in natural and processed foods.
- Food contamination-Physical, Chemical and Biological.
- Methods of detection of Physical, Chemical and Biological contamination.

PRACTICALS:

1. GHP and GMP in a Food industry
2. Developing the Process Flow sheet for the Food Establishment Including all the Inputs, Outputs and Interim Loops
3. Hazard Identification (Physical, Chemical and Biological)
4. Food Laws- Hygienic Requirements for Manufacturing Premises as Prescribed by Law
5. Visit to a nearby Food Establishment

REFERENCES

1. Mathur, P. (2018). Food Safety and Quality Control. Hyderabad: Orient BlackSwan Pvt. Ltd.,
2. Jung H. Han, Innovations in Food Packaging, Academic Press, 2014.
3. Scott A. Morris, Food and Package Engineering, Wiley-Blackwell Publishing, 2011.

Course Outcomes-After completion of the course, the student should be able to

CO 1. To understand the regulations followed in various food industries.
CO 2. To define the food labeling patterns.
CO 3. To analyze the safety operations involved in food system
CO 4. To know the HACCP standards in different food industries.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**3**						**1**	**3**	**3**			**3**
CO2						**2**			**3**			**3**
CO3						**3**		**3**	**3**			**3**
CO4						**3**		**3**	**3**			**3**

High-1, Medium-2, Low-1

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Second Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 205-B: FOOD LAWS AND REGULATIONS

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

SKILL ORIENTED COURSE

HSFS: 206-A: FOOD PRODUCT DEVELOPMENT AND COMMERCIALIZATION

(Common to M.Sc Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives - To enable the students to:

1. Illustrate the new product categories in food market and their characteristics.
2. Elucidate the process of new food product development in food industry.
3. Exemplify various specialty food products and their applications.
4. Acquire the skill to design and development of new food product and analyze the quality of the product.

THEORY

UNIT- I: New Food Products

- New food product: Definition, Characteristics, Need for New food product development.
- Classification of new food products: Line extensions - Repositioning of existing products - New form of existing product - Reformulation - New packaging - Innovative products - Creative products and Value added products.

UNIT-II: New Food product development Process

- Ideation/Idea generation, Concept development, Consumer research, Product design and Formulation.
- Process development: Prototype development and scale up.
- Quality assessment of new developed products: Sensory Evaluation, Shelf-Lifestudies.
- Packaging and labeling.

UNIT-III: Food Product Commercialization and Marketing

- Costing and Pricing, Test Market, Product launching, Product life cycle.
- Entrepreneurship, concept, Types, qualities and functions of an entrepreneur.
- Ethics and Intellectual property/ Patents in food product development.

- Artificial Intelligence in Food product development

UNIT-IV: Food Products with reference to

- Traditional Foods.
- Health foods, Medical foods, Therapeutic foods, Herbal foods, Fortified foods.
- Infant foods, Geriatric foods, Sports drink.
- Functional foods, Designer foods and Nutraceuticals.
- Probiotics, Prebiotic and Symbiotics.

PRACTICALS:

New Food Product Development and Marketing

1. Ideation and Concept Development.
2. Formulation and Standardization.
3. Sensory evaluation
4. Shelf life Studies.
5. Food and Nutrition labeling and packaging.

REFERENCES

1. Debashri, Ray.(2002). *Nutritional Challenge and Total Quality Management*, 1st edition;Sarup and Sons, New Delhi.
2. Gordon W.Fuller (2011), New Food Product development, 3rd edition, CRC press, Newyork.
3. Howard R.Moskowitz,(2009), An integrated approach to new product development, CRC press, Newyork.
4. Man, C.M.D. and Jomes, A.A.(1994).*Shelf life Evaluation of Foods*, Blackie Academic and Professional, London.
5. Mike Stringer and Colin Dennis.(2002). *Chilled foods A comprehensive guide*, 2nd edition ,Woodhead publishing limited, Cambridge, England, 2000.
6. Oickle, J.G. (1990).*New Product Development and Value Added*, Food Development Division Agriculture, Canada.
7. https://www.fssai.gov.in

Course Outcomes - After the completion of the course, the students will be able to:

CO1 Apply a product development process to generate ideas, develop concept to test market.

CO2 Design food and nutritional label of food products.

CO3 Demonstrate the skills to conduct the organoleptic evaluation of food product.

CO4 Work collaboratively with a team in food product development.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3		3		3	3	3		3	3	3	3	3	3
CO2	3		3		2		3	2	3		3	3	3	3
CO3	3		3		3	3				1	3	3	3	3

CO4	2		3			3	3		2		3	3	3	3

3-High, 2- Medium, 1- Low

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Second Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 206-A: FOOD PRODUCT DEVELOPMENT AND COMMERCIALIZATION

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.
2.
3.
4.
5.
6.
7.
8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

SKILL ORIENTED COURSE

HSFS: 206-B: FOOD WASTE MANAGEMENT

(Common to M.Sc Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives: To enable the students to:

- Know about the different wastes that are producing by the various food industries.
- Understanding of problems of food processing industrial waste.
- Become aware of Environment and health impacts food waste mismanagement.
- Understand engineering, financial and technical options for waste management.

THEORY

UNIT-I: Introduction

- Definition, Classification, nature, disposal practices, impacts on environment and economy;
- Types of food processing wastes; Types, availability and utilization of by-products of cereals, legumes and oilseeds, fruits and vegetables processing industries, sugar and agro based industries waste. Solid waste management. Waste water characteristics and treatment methods.

UNIT-II: Forms of Waste from Industries

- Concept, scope and maintenance of waste management and effluent treatment
- Temperature, pH, Oxygen demands (BOD & COD), fat, oil and grease content, metal content
- Forms of phosphorous and Sulphur in waste waters, microbiology of waste, other ingredients like insecticide, pesticides and fungicides residues

UNIT-III: Process of Waste

- Waste treatment and disposal, design, construction, operation and management of institutional community and family size biogas plants, concept of vermi-composting,
- Pre-treatment of waste: sedimentation, coagulation, flocculation and floatation, Secondary treatments: trickling filters, oxidation ditches, activated sludge process, rotating biological contractors, lagoons.

UNIT-IV: Utilization of Waste

- Waste utilization in various industries, furnace sand boilers run on agricultural wastes and by products
- Briquetting of biomass as fuel, production of charcoal briquette, generation of electricity using surplus biomass, producer gas generation and utilization.

PRACTICALS:

1. Categorize food waste into avoidable and unavoidable waste.
2. Analyze the sources of food waste and Propose strategies to reduce waste.
3. Process to set up a composting system and monitoring the composting process.
4. Investigation of portion control, food preservation, and reprocessing of leftovers and their impact on waste reduction.
5. Review existing local, national, or international food waste policies and assess the effectiveness of these policies.

REFERENCES

1. Kreit F &Goswami DY, Energy Management and Conservation Handbook. CRC Press, 2 nd edition, 2016
2. Amihud Kramer, Bernard A. Twigg, 2017: Quality control for the food industry, Fundamentals & Applications, Volume 1, 3rd Edition, Medtech Scientific International Ltd., Kolkata
3. Patrick DR., Fardo SW, Richardson RE & Steven, Energy Conservation Guidebook. The Fairmont Press, 3rd edition, 2015
4. Dev raj, Rakesh Sharma and V K Joshi, 2011: Quality control for value addition in food processing,Newindia publishing agency, PitamPura, New Delhi.
5. Arvanitoyannis I. 2007. Waste Management for the Food Industries. First Edition. Academic Press.

Course Outcomes:

CO 1. The student will be able to apply the principles of microbiology and biotechnology in handling wastes produced by the food industry

CO 2. The student will be able to develop processes for utilization of food waste.

CO 3 Perform skills in estimation required parameters in different samples.
CO 4 Gain the knowledge in conversion of by-products into useful products.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3			3	3	3	3	3	3	3	3	3
CO2	2		2	2		3	3				3	3	3	3
CO3	2					3	3			2	3	3	3	3
CO4	3	3	3	2	3	3	3	3	3	3	3	3	3	3

High-3, Medium-2, Low-1

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Second Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 206-B: FOOD WASTE MANAGEMENT

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.
2.
3.
4.
5.
6.
7.
8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

HSFS-207: PRACTICAL- IV: 205+206

HSFS -205: A-Food Safety and Quality Control

(OR)

B-Food Laws and Regulations

+

HSFS -206: A-Food Product Development and Commercialization

(OR)

B-Food Wastage Management

HSFS-208: OPEN ONLINE TRANSDISCIPLINARY COURSE-1

HSFS-209: INDIAN KNOWLEDGE SYSTEM-2

SEMESTER- III

SRI VENKATESWARA UNIVERSITY::COLLEGE OF SCIENCES
DEPARTMENT OF HOME SCIENCE
CHOICE BASED CREDIT SYSTEM (C.B.C.S) SYLLABUS AS PER NEP 2020
WITH EFFECT FROM THE ACADEMIC YEAR 2024-2025 onwards
FOOD SCIENCE NUTRITION & DIETETICS (HSFS)

SEMESTER-III

SI.No	Components of Course	Code	Title of the Course	Hrs/ Week	No. of Credits	SEE	IA	Total
1	**CC**	HSFS -301	Institutional Food Service Management	**4**	**4**	**70**	**30**	**100**
2		HSFS -302	**A-**Nutritional Biochemistry	**4**	**3**	**50**	**25**	**75**
			B-Nutrition during Life Span					
3		HSFS -303	**A-**Advances in Human Nutrition	**4**	**3**	**50**	**25**	**75**
			B-Geriatric Nutrition					
4	**P**	HSFS -304	**Practical -V(302+303)**	**6**	**2**	**35**	**15**	**50**
5	**SOC**	HSFS -305	**A-**Clinical Nutrition & Dietetics	**4**	**3**	**50**	**25**	**75**
			B-Nutritional Assessment Techniques					
6		HSFS -306	**A-**Nutrition for Health and Fitness	**4**	**3**	**50**	**25**	**75**
			B-Sports Nutrition					
7	**P**	HSFS -307	**Practical-VI (305+306)**	**6**	**2**	**35**	**15**	**50**
8	**OOTC**	HSFS -308	Open Online Transdisciplinary Course-2	**-**	**2**	**-**	**100**	**100**
*	Seminar/Tutorial/Remedial classes and Quiz as part of			**4**	**-**	**-**	**-**	**-**

	Internal assessment					
Total		**36**	**20**	**340**	**260**	**600**

CORE COURSE

HSFS: 301- INSTITUTIONAL FOOD SERVICE MANAGEMENT

Course Objectives - To enable the students to:

1. Understand the different types and management of food services and exposure to the dietary department in a hospital setting.
2. Acquire knowledge on finance, personnel management, duties and responsibilities of dietitians.
3. Gain skills to act in a variety of capacities in clinical, administrative, and community settings.
4. Apply skills on quantitative food production and planning diet plans for different diseases by placing in hospitals.

THEORY

UNIT-I: Introduction to food service Industry

- Principles and functions of food service management.
- Need and importance
- Tools of Management.
- Types: Hotels and Restaurants - Hotels/Motels, restaurants, cafes, clubs public, houses, bars, speciality restaurants, fast foods, take-away, street foods.
- Welfare and Industrial - Residential establishments - School, colleges, hostels, old people House, Hospitals, nursing homes, Industrial canteens, Temple feeding and Marriage feeding.
- Transport - Railway, Airlines and Sea.

UNIT-II: Infrastructure and Equipment in Food Institutions

- Building plans, outlays of work places - kitchen spaces, storage spaces and service areas.

- Equipment - Classification of equipment, selection of equipment, Design, installation, operation and maintenance.
- Menu – types of menu in Food service institutions, principles and planning
- Food service operation and types of food services - systems of service, mechanics of waiter service, self-service, vending and mobile catering.
- Food services systems - Introduction, Standards of hygiene.
- Computers in service - Introduction, catering controls.

UNIT-III: Food safety in public catering.

- Health and Hygiene of personnel and food service.
- Laws governing food service in public catering.
- Sanitation of food service establishments.
- Food safety in hotels, restaurants, street foods, industry and canteens, hospitals, hostels, airlines, railways, temple and mass feeding programmes.
- Food safety awareness programmes to food handlers and consumers.

UNIT IV: Financial and Personnel Management

- Definition and scope of financial management.
- Cost concept, cost control and pricing.
- Book keeping and accounting.
- Personnel Management - Recruitment, selection and Induction, Job analysis, description Monitoring work employee facilities and benefits, In-service Training.
- Skills required operating and managing food service system.

REFERENCES

1. Ronald Kinton and victor cesarani (1992),"The theory of catering", Butler and Tanner Ltd. France and London.
2. Mohinisethi and Surjeet Mohan (1993), "Catering management - An integrated approach", second edition, Wiley easteem limited, New Delhi.
3. Ramesh V. Bhat and R. NageswaraRao (1996), "Food safety", Bappco (Ltd). Mysore, Banglore.
4. Ramesh V. Bhat and R. NageswarRao (1992), "Food safety in public catering", NIN, ICMR, Hyderabad.
5. Gulani, K.K. 2005. Community Health Nursing. 1st Edition. Kumar Publishing House New Delhi. Pp – 662 to 664.
6. Gupta M.C., Mahajan B.K. 2003. Textbook of Preventive and Social Medicine. Third Edition. Jaypee Brothers Medical Publishers. New Delhi. India. Pp- 355-357.

Course Outcomes - After completion of this course, students will be able to:

CO1 Gain knowledge in management of food service establishments.

CO2 Knowledge on skills in finance and personnel management.

CO3 Acquire skills in planning diets for different diseases.

CO4 Apply skills as a competent Dietitian

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3			3							3	3	3	
CO2	3			3							3	2	3	
CO3						3			3		3	2		3
CO4						3			3		3	2		3

3-High, 2- Medium, 1- Low

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Third Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 301- INSTITUTIONAL FOOD SERVICE MANAGEMENT

Time: **Max Marks: 70**

SECTION- A 4x5=20Marks

Answer any FOUR of the Following
Each question carries 5 marks

1.
2.
3.
4.
5.
6.
7.
8.

SECTION- B 4x12.5 =50 Marks

Answer ALL questions
Each Question carries 12.5 Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

CORE COURSE

HSFS: 302-A: NUTRITIONAL BIOCHEMISTRY

Course Objectives - To enable the students to:

1. Understand the metabolism of nutrients in human physiology.
2. Acquire knowledge on factors affecting digestion, absorption of nutrients.
3. Create awareness on enzymes and its role in nutrient metabolism.
4. Apply skills in analyzing enzymes and its metabolites

THEORY

UNIT- I: Metabolism of Carbohydrates and Lipids

- Carbohydrates: Functions, digestion and absorption of carbohydrates. Carbohydrate metabolism- Glycolysis, Glycogenolysis, glycogenesis and Gluconeogenesis.
- Lipids: Functions, digestion and absorption of lipids. ®oxidation of fatty acids and Cholesterol Metabolism. Lipids of biological significance - Lipoproteins and prostaglandins in health and disease.

UNIT- II: Proteins and Amino Acids

- Functions, digestion and absorption of proteins.
- Metabolism of amino acids - Amino Acid decarboxylation, Tran's peptidation. Urea cycle, creatine and Creatinine - biosynthesis.
- Nucleic acid - DNA, RNA, Bases - Purines and Pyrimidines, Synthesis of Nucleic Acids - Steps of replication - Initiation, Elongation and Termination. Protein biosynthesis.
- Enzymes – Classification, structure, functions of enzymes; factors affecting enzyme activity.

- Integration of metabolism of carbohydrates, fats and proteins, Electron Transport Chain (ETC), Oxidative Phosphorylation.

UNIT-III: Vitamins

- Fat Soluble Vitamins A, D, E and K: Absorption, Transportation, Metabolism, physiological and biochemical functions
- Absorption, Transportation, Metabolism, physiological and biochemical functions of Water-Soluble Vitamins-Thiamine, Riboflavin, Niacin, Pyridoxine, Folic acid, Pantothenic acid, Vitamin C.

UNIT- IV: Minerals and Trace elements

- Absorption, Transportation, Metabolism, Physiological and biochemical functions, of Calcium, Phosphorus, Iron, Iodine, Zinc, Sodium, Potassium,Chloride and Flourine
- Electrolytes.

PRACTICALS:

1. Estimation of Blood glucose.
2. Estimation of Serum Proteins by Biuret
3. Estimation of Serum Triglycerides and Cholesterol.
4. Estimation of Serum Iron and Haemoglobin.
5. Normal and abnormal urine analysis.

REFERENCES

1. Satyanarayana U and Chakrapani U (2021) Biochemistry. Books and Allied (P) Ltd. Kolkotta. 5th edition
2. Victor L. Davidson and Donald B. Sihman. (1994). Biochemistry, The National Medical Series for Independent Study. Harward Publishing.
3. Keith Wilson and John Walker.)2000). Practical Biochemistry Principles and Techniques". 5th Edition.Cambridge University Press.
4. David L. Nelson and Michael M. cox. Lehninger. (2001). Principles of Biochemistry, 3rd Edn. MacMillan worth Publishers.
5. Talwar G.P. (1989). Text book of Biochemistry and Human Biology" 2nd Edn. National Book Trust in India.
6. Harold Varley. (2010). Practical Clinical Biochemistry"-4th Edn.CBS.Publishes. Delhi.

Course Out comes - After completion of this course, students will be able to:

CO1 Understand the metabolism of food and nutrients in humans.
CO2 Know metabolism of nutrients in healthy and disease individuals.
CO3 Acquire skills in Qualitative and quantitative estimation of metabolites in biological fluids.
CO4 Know Skills in analysing enzymes and its metabolites.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PSO2
CO1	3	3		3										
CO2	3	3		3										
CO3	3			3	3	2						2		
CO4	3			3	3	2						2		

3-High, 2- Medium, 1- Low

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Third Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 302-A: NUTRITIONAL BIOCHEMISTRY

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.
2.
3.
4.
5.
6.
7.
8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

CORE COURSE

HSFS: 302-B: NUTRITION DURING LIFE SPAN

Course Objectives - To enable the students to:

1. Gain knowledge on the importance of nutrition during life span.
2. Enlighten the principles and working applications during dietary modifications.
3. Comprehensive knowledge on analyzing the nutritional requirements.
4. Apply Computational skills in the Nutritional allowances during life span.

THEORY

UNIT-I: Nutrition during Pregnancy & Lactation:

- Nutrient requirement during pregnancy, intake and gaps, prenatal and antenatal nutritional importance, metabolic adjustments in pregnancy.
- Nutrition intervention and pregnancy outcome, Nutritional management, problems and Complications.
- Nutritional requirements during lactation, physiology of milk production, effects of lactation on Nutrition composition of Human-Milk,
- Factors affecting breast milk quality and comparative advantages & disadvantages of breast and formula feeding.

UNIT-II: Nutrition during Infancy & Early child hood period:

- Nutritional requirements, concerns and overall development during Infancy.
- Need for infant formulae, types of infant formulae, care in Preparation, and importance of preparation of weaning foods.

- Home prepared versus commercial weaning foods, Feeding problems-Lactose and cow's milk protein intolerance.
- Pre-school children: Age, growth & development, nutrient requirements, Intake and gaps. Effects of Macro & Micro nutrient malnutrition on physical and mental development.

UNIT-III: Nutrition during School-going children & Adolescents:

- Dietary patterns and factors to be considered. Implications of childhood obesity and other nutritional concerns. Healthy food choices during childhood.
- Growth during adolescence, nutritional requirements, hormonal influences, age of menarche-factors affecting, physiological problems and nutritional issues in adolescence.
- Nutritional requirements and RDA. Behavioural characteristics and feeding problems.

UNIT-IV: Nutrition during adulthood and old age:

- Nutritional requirements for adult man and woman. Nutritional concerns, RDA, nutritional guidelines and work efficiency. Physiological changes in aging, effects of aging on nutritional health.
- Modification in diet, feeding old people. Nutritional concerns in old age and their management.

PRACTICALS:

1. Planning and preparation of diet for Pregnant and Lactating women.
2. Planning and preparation of weaning foods.
3. Planning and preparation of diet for Pre-school, School going child.
4. Planning and preparation of diet for Adolescent and Adult.
5. Planning and preparation of diet for old age.

REFERENCES

1. Seth V and Singh K. Diet planning through life cycle: Part 1. Elite publishing house pvt ltd, New Delhi. 2006.
2. Mahtab S. Bamji, Kamala Krishna Swamy and G N V Brahmam. Text book of Human Nutrition. Oxford and IBH Publishing, New Delhi. 2009.
3. Michelle McGuire, Kathy A Beer Man. (2011). Nutritional sciences From Fundamental to Food, Second Edition, Wadsworth Cengage Learning, Belmont, USA
4. Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C.(Ed)(1999). Modern Nutrition in Health and Disease, 9th Edition, Williams and Wilkins.
5. Whitney, E.N. and Rolfes, S.R.(1999). Understanding Nutrition, 8th Edition, West/Wadsworth, An International Thomson Publishing Co.

Course Out comes- After completion of this course, students will be able to:

CO1 Acquire knowledge on nutritional requirements at various stages.

CO2 Apply the knowledge of nutrition during planning and preparation of diet.

CO3 Assess and compare diet and nutritional requirements relative to age, developmental and disease status.

CO4 Evaluate nutrition products for composition, quality, and appropriateness of use and formulate dietary interventions to address nutritional deficiencies.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PS
CO1	3	3		2			2					2	3	
CO2	3	3	3	2			3					2	3	
CO3	3	3	3	2					2			2		3
CO4	3	3	3	2			3		2			2		3

3-High, 2- Medium, 1- Low

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Third Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 302-B: NUTRITION DURING LIFE SPAN

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.
2.
3.
4.
5.
6.
7.
8.

S ECTION- B 4x10=40 Marks

Answer ALL questions
Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

CORE COURSE

HSFS: 303-A: ADVANCES IN HUMAN NUTRITION

Course Objectives - To enable the students to:

1. Know the advance concepts of nutrition of Brain, Immunity and Sports.
2. Understand the concepts of dietary management in endemic nutrition problems.
3. Create knowledge on the dietary management during emergencies.
4. Planning and preparation of foods in special needs like space, high altitudes and low temperatures.

THEORY

UNIT-I: Nutrition, Brain and Behaviour

- Brain – Structure, composition and functions and neurological tests-EEG, PET, MRI.
- Neurotransmitters- Nutrient precursors of neurotransmitters – Tryptophan, tyrosine, choline and lecithin
- Role of neurotransmitters in Brain function
- Role of Nutrients on Brain growth and development

UNIT-II: Nutrition and Immunity

- Innate and Acquired immunity – Primary and secondary immune response, Active and Passive, Antigen, Antibody Cell mediated immunity, Humoral immunity-Formation, maturation and activation of B and T cells, Immune effectors system-cytokines complement system, K cells and NK cells, Cell mediated effectors response,

- Role of nutrients in immunity
- Effect of malnutrition on immunity

UNIT-III: Endemic Nutrition Problems and their Management

- Flurosis – Aetiology, prevalence, symptoms and nutritional management
- Iodine deficiency disorders - Aetiology, prevalence, symptoms and nutritional management
- Osteoporosis - Aetiology, prevalence, symptoms and nutritional management.

UNIT-IV: Principles of Nutrition and management systems in Disasters and Emergencies and Special Environments.

Nutrition in Disasters

- Disaster management –Natural and Manmade Disasters.
- Assessment of food needs in emergency situations.
- Food distribution strategy – Identifying and reaching the vulnerable group
- Targeting Food Aid.
- Mass and Supplementary Feeding / Special foods/rations for nutritional relief
- Food and Nutrition security
- Nutrition in Special needs-High altitudes and Low temperatures.
- Space nutrition.

PRACTICALS:

1. Planning and preparation of Brain foods.
2. Planning and preparation of antioxidant and calcium rich diets.
3. Iodine testing in salt and Flourine testing in water.
4. Assessment of household food and nutrition security and calculation of Hunger Index.
5. Planning and preparation foods for Astronauts, High altitudes and Low temperatures.

REFERENCE

1. Whitney and Sharon RadyRolfes. (1999). Understanding Nutrition" (8th edition) An International Thomson Publishing Company, Albnay, New York, USA, Wadsworth Publishing Company.
2. M.S. Bamiji, N. PrahladRao and VinodiniReddy . (1998). Text Book of Human Nutrition" Oxford and IBFI Publishing Co. Pvt. Ltd., New Delhi.
3. Heather Hedrick Fink, Alan E. mike sky. (2012). Practical Applications in Sports Nutrition, Third Edition, Library of Congress Cataloging in Publication Data. United States of America.
4. Michelle McGuire, Kathy A Beer man. (2011). Nutritional sciences From Fundamental to Food, Second Edition, WadsworthCengage Learning, Belmont, USA.
5. C.Gopalan, B.V.RamasastriandS.C.BalaSubramanian. (2012). Nutritive Value of Indian Foods. National Institute of Nutrition, Indian Council Medical Research Hyderbad.
6. Nutrient Requirements andRecommended Dietary Allowance forIndians A Report of The Expert Group of ICMR.2010.

7. Dr.M. Swami Nathan. (2010). Food and Nutrition Volume-2 Second Edition the Bangalore Printing and Publishing Co Ltd Bangalore 560018.

Course Out comes - After the completion of the course students will be able to:

CO1 Acquire knowledge on advanced nutrition concepts and management

CO2 Demonstrate and apply the concepts and designing foods for brain, immunity and sports.

CO3 Skills to manage the diet in emergency situations.

CO4 Present knowledge on designing foods for special needs.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PS
CO1	3	3					2			2		2	3	
CO2	3	3		3			2			2		2	3	
CO3	3	3	3	3		2						2		3
CO4	3	3	3	3		3						2		3

3-High, 2- Medium, 1- Low

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Third Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 303-A: ADVANCES IN HUMAN NUTRITION

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following

Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions

Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

CORE COURSE

HSFS: 303-B: GERIATRIC NUTRITION

Course Objectives - To enable the students to:

1. Understand the physiological changes and theories of ageing.
2. Gain knowledge on importance and consequences of diet in elderly.
3. Create awareness on degenerative diseases, life style genesis and its management through diet.
4. Able to explain government programs and policies for elderly.

THEORY

UNIT-I: Changes in Ageing

- The process of Ageing – Physiological biochemical and body compositional changes – Theories of ageing.
- Socio-cultural and psychological aspects of ageing – Health seeking behaviour of the elderly.

UNIT-II: Nutritional requirements

- Food and Nutritional needs of the elderly – Dietary management – Special problem of women – menopausal, post-menopausal. Problems;
- Early nutrition and nutrition and health in later years.

UNIT-III: Diseases of Ageing

- Chronic degenerative diseases and nutrition and health problems of the elderly – their etiology.
- Genesis life style and living condition, management, prevention and control.

UNIT-IV: Programmes

- Policies and programmes of the government and NGO sectors pertaining to the elderly – old age homes**.**
- Day care and recreation centres – their need and scope.

PRACTICALS:

1. Assessment of nutritional status of elderly.
2. Analysis of nutritional requirements according to their physiological and health needs.
3. Menu Plan for special problems of elderly women.
4. Dietary recommendations during special conditions.
5. Preventive and control measures for genesis life style.

REFERENCE

1. Sharma, O.P. (Ed.) (1999): Geriatric Care in India – Geriatrics and Gerontology: A Textbook, M/S. ANB Publishers.
2. Mahtabs.Bamji and N.PralhadRao. (2004). Text book of Human Nutrition, Second Edition, Oxford and IBH Publishing co. PVT LTD. New Delhi.
3. Heather Hedrick Fink, Alan E. mike sky. (2012). Practical Applications in Sports Nutrition, Third Edition, Library of Congress Cataloging in Publication Data. United States of America.
4. Michelle McGuire, Kathy A Beer man. (2011). Nutritional sciences From Fundamental to Food, Second Edition, WadsworthCengage Learning, Belmont, USA.
5. Swami Nathan M. (2010). Food and Nutrition Volume-2 Second Edition the Bangalore Printing and Publishing Co Ltd Bangalore 560018.
6. ShubhanginiA.Joshi. (2010). Nutrition and Dietetics Third Edition Tata Mecgraw Hill Education Private Limited New Delhi.

Course Out comes - After completion of this course, students will be able to:

CO1 Acquire knowledge on process of ageing.
CO2 Describe diet plans for different disease conditions in elder people.
CO3 Illustrate the available government benefits for elder people.

CO4 Plan diet according to recommendations for elder people.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3											3	
CO2	3	3							2	2			3	
CO3	3	3	2			2			2	2				3
CO4						3						2		3

3-High, 2- Medium, 1- Low

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Third Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 303-B: GERIATRIC NUTRITION

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions

Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

HSFS-304: PRACTICAL -V: 302+303

HSFS-302: A- Nutritional Biochemistry

(OR)

B- Nutrition during Life Span

+

HSFS-303: A- Advances in Human Nutrition

(OR)

B- Geriatric Nutrition

SKILL ORIENTED COURSE

HSFS: 305-A: CLINICAL NUTRITION AND DIETETICS

Course Objectives - To enable the students to:

1. Understand the dietary principles for various diseases.
2. Comprehend knowledge in Dietary modifications for the management of diseases.
3. Application of principals in preparation and service of diets to the patients.
4. Able to assess the case studies and construct the diet charts.

CORE THEORY

UNIT- I: Medical Nutrition Therapy in Genetic Metabolic Disorders

- Phenylketonuria (PKU), Maple syrup urine disease (MSUD),
- Lactose Intolerance, Galactosemia,

- Tyrosinemia, Homocystinuria.

UNIT- II: Medical Nutrition Therapy in Neurological and Rheumatic Disorders

- Neurological Disorders –Migraine syndrome, Alzheimer's disease, Parkinson's disease.
- Musculoskeletal and Rheumatic Disorders- Osteoporosis, Osteoarthritis, Rheumatoid Arthritis, Gout.

UNIT- III: Medical Nutrition Therapy in Critical Care

- Surgery: Pre and post-operative Conditions
- Metabolic Stress: Trauma, Sepsis and Burns.
- HIV and AIDS.
- Cancers.
- Heart Failure, Renal Failure, Dialysis.

UNIT-IV: Food and Drug Interactions

- Risk factors for food and drug interactions.
- Effect of food on drug therapy.
- Effect of drug on food and nutrition.
- Modifications of drug action by food and nutrition.
- Effect of drug on nutritional status.

PRACTICALS:

1. Medical Nutrition Therapy for Musculoskeletal and Rheumatic Disorders
2. Medical Nutrition Therapy for pre and post operative conditions and HIV/AIDS.
3. Medical Nutrition Therapy for Critical Care.
4. Diet Supplements and Formulas in MNT and Critical care.
5. Preparation of Diet charts.

REFERENCE

1. Whitney NE, Cataldo BC, Rolses RS. (1987).Understanding Normal and Clinical Nutrition" West Pub.Company. St Paul, New Yok, Los Angeles, San Fransisco.
2. Mahan, L.K. and Escott-Stump, S. (2000): Krause's Food Nutrition and Diet a Therapy, 10th Edition, W.B. Saunders Ltd.
3. Shils, M.E., Olson, J.A., Shike, M. and Ross, A.C. (1999): Modern Nutrition inHealth and Disease, 9th Edition, Williams and Wilkins.

4. Williams, S.R. (1993): Nutrition and Diet Therapy, 7th Edition, Times Mirror/MosbyCollege Publishing.
5. Davidl. Katzwolters Kluwer/LippinCottWilliams and Wilkins. (2007). Nutrition in Clinical Practice Second Edition.
6. ShubhanginiA.Joshi. (2010). Nutrition and Dietetics Third Edition Tata Mecgraw Hill Education Private Limited New Delhi.

Course Out comes - After the completion of the course, the students will able to:

CO1 Apply the concepts of threupatic modification of diets for the diseases.
CO2 Calculate nutrients and modify diets for the diseases.
CO3 Skills in Planning and preparation of diets for different disease conditions.
CO4 Able to know patient Diet service management and counselling.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3				2	2		2	2		2	3	
CO2	3	3				2	2		2	2		2	3	
CO3	3	3	2	3		3	3		3	2		2		3
CO4	3	3	2	3		3	3		3	2		2		3

3-High, 2- Medium, 1- Low

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Third Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)
HSFS: 305-A: CLINICAL NUTRITION AND DIETETICS

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks
Answer any FIVE of the Following
Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions

Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

SKILL ORIENTED COURSE

HSFS: 305 -B: NUTRITION ASSESSMENT TECHNIQUES

Course Objectives - To enable the students to:

1. Understand the methods of nutritional status assessment.
2. Apply knowledge on assessment techniques of protein quality in diets.
3. Plan nutrition research using animal models.
4. Design nutrition research using Human models.

THEORY

UNIT-I: Nutritional Status Assessment

- Principles and objectives of nutritional assessment.
- Nutritional assessment as a tool for improving the quality of life of various segments of the population.

- Need of nutrition and health status. Role of National Nutrition Monitoring Bureau (NNMB), National Nutrition Mission (NNM), National Institution of Nutrition (NIN).
- Types of assessment techniques- Direct and Indirect methods.

UNIT-II: Anthropometric and Biochemical Assessment Techniques

- Anthropometric assessment: Introduction, Definition, Methods of measurements, Standardizations Classification of Nutritional status.
- Biochemical assessment: Need for Biochemical test, Interpretation of biochemical test, Types of test.

UNIT-III: Clinical and Dietary Assessment Techniques

- Clinical assessments: Assessment of clinical signs in various disorders.
- Dietary Assessments: Types of Diet surveys, methods of Diet surveys, analysis and interpretation, problems in Diet surveys and solutions.

UNIT-IV: Indirect methods of Nutritional Assessment

- Vital statistics and their role in nutritional assessment.
- Health statistics- Mortality and Morbidity rates.
- Ecological and socioeconomic variables and other Records.
- Current methodologies of assessment of nutritional status, their interpretation and comparative applications.

PRACTICALS:

1. Assessment of Nutritional status by Anthropometry methods.
2. Assessment of Nutritional status by Clinical and biochemical methods.
3. Assessments of Nutritional status by 24 hours re-call method.
4. Assessment of Nutritional status by Food frequencies and diet records
5. Assessment of Nutritional status by indirect methods.

REFERENCES:

1. Mahatab.S. Bamiji, N. PrahladRao and VinodiniReddy . (2001). Text Book of Human Nutrition" Oxford and IBFI Publishing Co. Pvt. Ltd., New Delhi.
2. Swaminathan M. (1995).Advanced Text book on "Food and Nutrition" (Applied aspects) Vol. II BAPPCO, The Bangalore Printing and Publishing Co. Ltd., (Chapters 21, 24) Bangalore.
3. Whitney. E.N, and S.R.Rolfes. (1999). `Understanding Nutrition', (8th edition) Chap. 6 and Appendix `J'.Measures of Protein Quality - West/Wadsworth.

Course Outcome - After the completion of the course students will be able to:

CO1 Assess nutritional status using ABCD techniques.
CO2 Apply advance research techniques in dietary assessment.
CO3 Do nutrition research using animal models.
CO4 Design nutrition research using human models.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3			3	2		2					3	3	
CO2	3			3	2		2					3	3	
CO3	3			3			2					3		3
CO4	3			3			2					3		3

3-High, 2- Medium, 1- Low

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Third Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 305 -B: NUTRITION ASSESSMENT TECHNIQUES

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following
Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions

Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

SKILL ORIENTED COURSE

HSFS: 306-A: NUTRITION FOR HEALTH AND FITNESS

Course Objectives- To enable the students to:

1. Concepts of Health, Nutrition, physical activity, physical fitness and methods of evaluation.
2. Understand the factors affecting physical activity.
3. Role of macronutrients in physical performance and weight management.
4. Acquaint the nutritional needs in different physical performances.

THEORY

UNIT-I: Physical Activity and Exercise

- Definitions- fitness, Physical activity and Physical Fitness.

- Holistic approach to the management of fitness and health.
- Role of nutrition in fitness and effect of exercise on various systems.
- Health benefits of Physical activity and Recommendations.
- Physical Activity Guidelines and physical activity pyramid for health and fitness.

UNIT-II: Physical Fitness

- Types of fitness and Components of physical fitness -Cardiovascular Fitness, Muscular strength, Muscular Endurance, Flexibility, and Body composition.
- Factors affecting fitness and physical activity.
- Assessment of fitness and approaches for keeping fit.
- Evaluation of physical fitness- FITT Principles-Talk test, Target heart rate, Borg scale.

UNIT-III: Fitness and Physical Activity

- Fitness - health complications of overweight and obesity, body weight components and regulations of body weight.
- Assessment of fitness -Kinanthropometry**:** Definition; Introduction; Body size and proportion; Somato typing; Circumferences; Skin fold measurement sites and determining body composition;
- Factors influence to achieve body weight, under weight and overweight and its consequences as related to fitness.
- Physical activity and exercise- classification of physical activity, types of exercise and levels of physical activity.

UNIT-IV: Nutritional Requirements

- Fluid–Recommendations, Importance and Consequences of Fluid balance, Hydration in pre, during and post exercise.
- Water, Electrolytes, and Temperature Regulation during physical activity.
- Nutritional requirements and Energy requirements and assessment of energy expenditure based on physical activity.
- Nutritional requirements and special needs during pre, during and post physical activity.

PRACTICALS:

1. Assessment of physical fitness in different age groups/gender.
2. Assessment of energy expenditure based on physical activity record.
3. Study of lifestyles and physical activity patterns.
4. Physiological parameters like heart rate and blood pressure.
5. Visit to fitness centers.

REFERENCES

1. Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C.(Ed)(1999). Modern Nutrition in Health and Disease, 9th Edition, Williams and Wilkins.
2. Whitney, E.N. and Rolfes, S.R.(1999). Understanding Nutrition, 8th Edition, West/Wadsworth, An International Thomson Publishing Co.

3. McArdle, W.Katch, F. and Katch, V. (1996). Exercise Physiology, Energy, Nutrition and Human Performance, 4th edition, Williams and Wilkins, Philadelphia.
4. Ira Wolinsky(ed) (1998). Nutrition in Exercise and Sports, 3rd Edition, CRC Press.
5. Mahtabs.Bamji and N.PralhadRao. (2004).Text book of Human Nutrition, Second Edition, Oxford and IBH Publishing co. PVT LTD. New Delhi.
6. Heather Hedrick Fink, Alan E. mike sky. (2012). Practical Applications in Sports Nutrition, Third Edition, Library of Congress Cataloging in Publication Data. United States of America.
7. Michelle McGuire, Kathy A Beer Man. (2011). Nutritional sciences From Fundamental to Food, Second Edition, Wadsworth Cengage Learning, Belmont, USA

Course Outcomes – After completion of this course, students will be able to:
CO1 Gain knowledge on concepts of physical activity and physical fitness.
CO2 Describe the energy metabolism pathways in physical activity.
CO3 List the role of macronutrients in physical performance.
CO4 Demonstrate the importance of nutrients in Sports.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2										2	3	
CO2	3	2										1	3	
CO3	3		3									1		3
CO4	3			2	2							2		3

3-High, 2- Medium, 1- Low

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Third Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)
HSFS: 306-A: NUTRITION FOR HEALTH AND FITNESS

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks
Answer any FIVE of the Following

Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions

Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

SKILL ORIENTED COURSE

HSFS: 306-B: SPORTS NUTRITION

Course Objectives: To enable the students to:

- To understand the importance of nutrition for sports performance.
- To gain knowledge on Nutrional requirements related to performance.
- To acquire knowledge on role of endurance in performances.
- To know about nutrition during special condition.

THEORY

UNIT-I: Introduction to Sports Nutrition

- Definition and scope of Sports Nutrition - diet, performance & importance of sports nutrition.
- Types of sports and their nutritional requirements, Basic physiology of sports (body composition).
- Different phases of sports and nutritional requirements - effect of intensity and duration of exercise/sport.
- Ergogenic aids -Types, benefits and limitations.
- Measuring physical activity –Metabolic equivalent, Fatigue and endurance.

UNIT-II: Nutritional Requirements

- Carbohydrates types - Simple sugars - complex carbohydrates - Carbohydrate load - Muscle glycogen & performance.
- Protein and fat - requirement, types, metabolism, percent of intake at different phases
- Micronutrients: vitamins and minerals, Antioxidants- types, role, RDA and deficiencies- its role in Performance.
- Electrolytes - importance and role of electrolytes in Sport & performance.

UNIT-III: Nutrition for Endurance Sports

- Endurance sports - types.
- Nutrition for Ironman, Triathlon and Ultrathon - Nutrition for Intermittent sports.
- Nutrition for winter sports, Nutrition for Weight conscious sports, nutrition for martial artists in the Olympics - Judo, Wrestling, Wushu, Taekwondo. Nutrition in swimming.
- Nutrition for adventure sports, Kayaking, Canoeing, and other water sports.

UNIT-IV: Nutrition during Special Condition

- Effect of Climate & Environment on sports performance.
- Dehydration & performance- Assessment of fluid loss, proper pre-hydration, rehydration / fluid replacement, Sweat, Thermoregulation.
- Electrolyte loss & exercise- maintaining / restoring electrolyte balance, Sports & energy drinks, Vegetarian athletes.
- Female athletes, Geriatric Sports nutrition, Age categorized sports, growth and nutrition, Nutrition for the differentially able involved in sports.

PRACTICALS:

1. Assessment of nutritional requirements based on their activity.
2. Plan a day's diet for a female athlete.
3. Plan a day's diet for a male athlete.
4. Types of electrolytes.
5. Nutritional ergogenic aids and their composition.

REFERENCES:

1. Reaburn, P. R. (Ed.). (2014). Nutrition and Performance in Masters Athletes. CRC Press.

2. Eberle, S. G. (2013). Endurance Sports Nutrition, 3E. Human Kinetics.
3. Campbell, B. (Ed.). (2013). Sports nutrition: enhancing athletic performance. CRC Press
4. Slater, G., & Phillips, S. M. (2011). Nutrition guidelines for strength sports: sprinting, weightlifting, throwing events, and bodybuilding. Journal of sports sciences, 29(sup1),S67S77.
5. Ryan, M. (2012). Sports nutrition for endurance athletes. Velo Press.
6. Zinner, C., & Sperlich, B. (Eds.). (2016). Marathon running: Physiology, psychology, nutrition and training aspects. Cham: Springer.
7. Campbell, B. (Ed.). (2013). Sports nutrition: enhancing athletic performance. CRC Press.
8. Larson-Meyer, D. E. (2007). Vegetarian sports nutrition. Human Kinetics.
9. Dunford, M., & Doyle, J. A. (2021). Nutrition for sport and exercise. Cengage Learning.

Course Outcomes:

- Understanding the relation between nutrients in sports.
- Identify the role of climate and environment on sports performance.
- Develop the understanding of specified nutrition regime for various sports & latest developments.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2										2	3	
CO2	3	2										1	3	
CO3	3		3									1		3
CO4	3			2	2							2		3

- 3-High, 2- Medium, 1- Low

Model Question paper

SRI VENKATESWARA UNIVERSITY: TIRUPATI
M.Sc Home Science Degree Examination
Third Semester
Specialization: M.Sc., Food Science Nutrition and Dietetics
(NEP for the students admitted from 2024-25 onwards)

HSFS: 306-B: SPORTS NUTRITION

Time: **Max Marks: 50**

SECTION- A 5x2=10Marks

Answer any FIVE of the Following

Each question carries 2 marks

1.

2.

3.

4.

5.

6.

7.

8.

S ECTION- B 4x10=40 Marks

Answer ALL questions

Each Question carries 10Marks

9. (a).

(or)

(b).

10. (a).

(or)

(b).

11. (a).

(or)

(b).

12. (a).

(or)

(b).

HSFS-307: PRACTICAL - VI: 305+306

HSFS-305: A- Clinical Nutrition &Medical Nutrition Therapy

(OR)

B- Nutritional Assessment Techniques

+

HSFS-306: A-Nutrition for Health and Fitness

(OR)

B- Sports Nutrition

HSFS-308: Open Online Transdisciplinary Course-2

SEMESTER- IV

SRI VENKATESWARA UNIVERSITY::COLLEGE OF SCIENCES
DEPARTMENT OF HOME SCIENCE
CHOICE BASED CREDIT SYSTEM (C.B.C.S) SYLLABUS AS PER NEP 2020
WITH EFFECT FROM THE ACADEMIC YEAR 2024-2025 onwards
FOOD SCIENCE NUTRITION & DIETETICS (HSFS)

SEMESTER-IV

SI.No	Components of Course	Code	Title of the Course	Hrs/ Week	No. of Cre	SEE	IA	Total

					dits			
1.	**OOSDC**	HSFS -401	Open Online Skill Development Courses	-	8	-	200	200
2.	**PW**	HSFS -402	Project Work-Orientation Classes	24	12	300	0	300
*	Conducting classes for competitive exam, communication skills, UGC/CSIR and NET examinations			12	-	-	-	-
Total				**36**	**20**	**300**	**200**	**500**
TOTAL SEMESTERS				**144**	**84**	**1320**	**880**	**2200**

HSFS-401: OPEN ONLINE SKILL DEVELOPMENT COURSES

HSFS-402: PROJECT WORK

Dissertation:

The students will be placed as Interns in Hospitals/Institutes/Food Service Establishments for a period of 3-4 months to carry out their project work and submit the dissertations.

Seminar:

The student has to present the seminar based on the project work done in the presence of Department Research Committee.

Viva-voce:

The viva-voce will be conducted on the project at the end of the semester.