



DEPARTMENT OF HOME SCIENCE
S.V.U. COLLEGE OF SCIENCES
SRI VENKATESWARA UNIVERSITY: TIRUPATI

The members of Board of Studies in Home Science (Combined) for PG programme, met online on **09-11-2021 at 2 pm** to approve the syllabus framed as per Action Plan of the NEP- 2020 to be implemented for the students joining from 2021-2022 academic year onwards.

The following are the minutes of the BOS Meeting which are common for the below mentioned four courses of the Post-Graduate programmes offered by the Dept. of Home Science, Sri Venkateswara University :

- M.Sc. Food Science Nutrition and Dietetics (FSND) (Regular)
- M.Sc. Human Development and Child Welfare (HDCW) (Regular)
- M.Sc. Extension Management and Communication Technology (EMCT) (Regular) and
- MS Food Technology (FT) (Self Supporting Course).

RESOLUTIONS :

1. Resolved to recommend that the members of Board of Studies of Department of Home Science belonging to respective specializations have reviewed the revised Post-graduate syllabus for four M.Sc., programmes viz., Food Science Nutrition and Dietetics and Food Technology, Human Development and Child Welfare, Extension Management and Communication Technology offered by the Department of Home Science and approved the same by incorporating suggestions / modifications given.
2. Resolved to recommend that Human Values and Professional Ethics-I in first semester and Human Values and Professional Ethics-II in second semester be treated as 'Audit Courses' (100 marks internal with Zero credits).
3. Resolved to recommend to introduce **Skill oriented Course** as mandatory in the third Semester for 100 marks. Out of 100 marks the allotment of marks for Theory is 50 (Out of which 10 marks for internal and 40 marks for external assessment) and 50 marks for practical. It is also resolved that the students will be sent for Internship programme for practical experience (50 marks) as skill development needs hands-on-experience.
4. It was recommended to make **Research Work (Thesis)** as mandatory for three regular Programmes of Home Science Viz., Food Science Nutrition and Dietetics,

Human Development and Child Welfare and Extension Management and Communication Technology .

5. Resolved to recommend to introduce Multi-disciplinary Course / Project work/ MOOC'S as mandatory in the Fourth Semester for students of Food Technology programme for 100 marks.
6. Resolved to recommend that the following two papers as common for three regular PG. programmes offered by the Department.
 - Elective Foundation- 104-Community Nutrition
 - Elective Foundation - 204- Research Methodology and Statistics
7. Resolved to recommend that the following papers are common for Food Science Nutrition and Dietetics and Food Technology in Four semesters ;
 - Semester-I
 - 101-Food Chemistry and Analysis
 - 103- Food Science and Experimental Foods
 - Semester-II
 - 203- Food Microbiology and Safety
 - Semester-III
 - 301-Food Processing and Preservation Technology
 - 303e- Baking Technology
 - Semester-IV
 - 401- Food Safety Standards and Quality Control
 - 402- Food Product Development and Marketing
 - 403a- Nutrition for Health and Fitness
 - 403e- Nutrition in Emergencies and Disaster Management
8. Resolved to recommend that there is no change in question paper format. Hence, the existing pattern is recommended.

Members Attended

- 1. Prof. K. Anuradha
Associate Prof.
Dept. of Home Science
MSTU Mysore - 570 002
- 2. Dr. K.V. Subrahmanyam
Associate Prof.
Dr. B.V. Prasad Swamy Center for Research
& Training
MSTU Mysore - 570 002
- 3. Prof. Anuradha
Associate Prof.
Dept. of Food Science & Nutrition
University of Mysore, Mysore
- 4. Prof. J. Uma Devi
Associate Prof.
MSTU Mysore
MSTU Mysore - 570 002
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- 5. Prof. R. Geetha Reddy
Associate Prof.
Dept. of Food Science and Nutrition
College of Education, Sri Jayachamarajendra
Wodeyar Institute of Technology
Mysore - 570 002
- 6. Dr. E. Manjula, Asst. Prof.
MSTU
MSTU Mysore
MSTU Mysore - 570 002
- 7. Dr. H. Anuradha, Asst. Prof.
MSTU
MSTU Mysore
MSTU Mysore - 570 002

Members

- 1. *K. Anuradha*
9/11/2021
- 2. *Subrahmanyam*
9/11/2021
- 3. *Anuradha*
9/11/2021
Dr. ANURADHA
Professor
JOS in Food Science & Nutrition
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- 4. *Uma Devi*
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Dr. J. UMA DEVI
Associate Prof.
MSTU Mysore
MSTU Mysore - 570 002
- 5. *Geetha Reddy*
9/11/2021
Dr. R. GEETHA REDDY
Professor
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Wodeyar Institute of Technology
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- 6. *Manjula*
9/11/2021
- 7. *Anuradha*
9/11/2021

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Program me Code	Programme name	Year of Introduction	Status of implementation of CBCS/Elective Course System (ECS)	Year of implementation of CBCS/ECS	Year of revision (if any)	If revision has been carried out in the syllabus during the last 5 years, Percentage of Content added or	Link to the relevant documents
254	Food Technology	2021	CBCS: Yes ECS: Yes	C B C S 2 0 2 1 E C S : 2 0 2 1	CBCS 2021 ECS: 2021	CB CS: 95% ECS : 95 %	Enclosed

DEPARTMENT OF HOME SCIENCE
S.V.U. COLLEGE OF SCIENCES
SRI VENKATESWARA UNIVERSITY: TIRUPATI



RESTRUCTURED CURRICULUM FOR
M.Sc. FOOD TECHNOLOGY (Self-Supporting Course) PROGRAMME
TO BE IMPLEMENTED WITH EFFECT FROM THE ACADEMIC
YEAR 2021-2022

Amended as per NEP 2020

SYLLABUS
Choice Based Credit System (CBCS)
Amended as per NEP 2020

DEPARTMENT OF HOME SCIENCE
FOOD TECHNOLOGY (SSC)

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.

Mission

The Department of Home Science is committed to empower the students in capacity building skills through teaching, research and community oriented extension activities, thereby 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 :

The Department is having the following 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 out reach 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 practicals, 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 to the contribution to the interest of the society as a whole and perform well in their careers.

Programme Educational Objectives (PEO)

To enable students to:

1. Understand the methods and techniques of production, processing, preservation, packaging and labeling, safety and quality assurance of different foods.
2. Gain knowledge in development of new food products and evaluation in terms of physical, chemical, microbiological, safety attributes, sensory and shelf life.
3. Acquire skills in food formulations, processing, preservation and evaluation of foods for their safety with reference to standards nationally and globally.
4. Apply of food processing and preservation technologies in research and food industry

PROGRAMME OBJECTIVES:

1. To provide the theoretical and practical knowledge with regard to the various aspects of food i.e., science, Technology, microbiology and quality control measures involved in food products as well as their preservation techniques.
2. To identify, Understand and analyse the difficulties related to food technology and make the students to take proper decisions for the same.

3. To make the students learn about concepts in designing and developing of new food products to meet the current demands of consumers as well as industries.
4. To enable the students to get scientific knowledge through different food technology papers so that they can enhance their skills towards research and development.
5. To acquire the knowledge through different aspects such as unit operations in food processing, food packaging, preservation methods, dairy processing and bakery, confectionery, meat, poultry and fish processing and preservation methods.
6. To strengthen the students skills to work in different groups as well as an individual while they enter into the food industries, institutions, research and quality control laboratories, academic institutions and governmental agencies.
7. To provide effective interpersonal skills by conducting seminars and Presentations in each paper.
8. To attain the knowledge with regard to government policies and regulations of food quality and safety.
9. To facilitate the student to understand the personal and professional ethics towards the role of food technologist in the whole process of food product development.
10. To make the students to find the solutions for the problems occurred in industries by applying effective technologies in developing of by products as well as value added foods.
11. To assist the students towards entrepreneur through new food product development by conducting market research, shelf life studies and test marketing of food products.
12. To gain the knowledge and skills related to Academic, research, employee and entrepreneurial roles in the broad field of food technology for their holistic development.

PROGRAMME OUTCOMES:

1. Demonstrate and apply comprehensive knowledge and understanding gained in food Science, food chemistry, microbiology, Technology of various foods and food products, food processing, Food product development quality control and Community nutrition in an integrated manner to the development, processing, and preservation of safe, nutritious, and high-quality foods.
2. Identify, Understand and analyze problems related to food technology and make suitable decisions to find an appropriate solution for the same as identify the factors responsible

for food spoilage, food contaminants and adulterants and the methods to detect and control the same.

3. Design and develop food products by apply the concepts of Food Technology in creative manner to meet the needs and demands of the customers and industry. Formulate and develop tailor made products as per the needs of customers such as specialty foods.
4. Students develop a scientific knowledge with a sense of enquiry through various food technology papers. Able to strengthen research skills in order to meet the global challenges associated within all aspects of the food science and technology to develop their capacity to undertake research into the science of foods from farm to fork.
5. Demonstrate knowledge in various aspects of food and its application in food industry, concept of unit operations in food processing, conventional and advanced methods of food science, processing, preservation, methods of packing, post-harvest practices bakery and confectionery, meat, poultry and fish processing, food fermentation, dairy processing so as to develop food products. Able to Utilize advanced instruments and technologies to process and analyze food products and to solve food safety and quality related problems.
6. Able to work as individual as well as in teams with others from different backgrounds and confident to work in diverse socio-cultural settings with multicultural groups and teams in food industries, institutions, food research and quality control laboratories, academic institutions and governmental agencies as well as an entrepreneur.
7. Able to communicate orally and in writing related to discipline-specific, technical and non-technical aspects with effective interpersonal skills. seminars and Presentations in each paper enhances their confidence, ability to express themselves & presentation skills. Can effectively communicate scientific knowledge to meet the needs of industry and the consumer for the production and marketing of safe and quality foods.
8. Have knowledge in regulations governing on legal, safety, security and health issues and Able to follow food laws, regulations and safety standards in application of food additives preservatives etc. and apply the principles of Hazard Analysis and Critical Control Points (HACCP) to ensure safe food processing.
9. Understand and apply personal and professional ethics and responsibilities of food technologist in product development, quality, documentation and publications.
10. Find solutions for industrial and societal problems by effective utilization of byproducts, developing value added foods and transfer of technologies for sustainable development.

11. Screen business ideas, conduct market research, acceptability, quality control, shelf life studies and test market of the food products to avoid risks in commercialization of food products.
12. Acquire ability to gain knowledge and skills which are necessary throughout their life as professionals seeking to expand their career prospects into a wide range of Academic, research, employee and entrepreneurial roles in the broad field of food technology for their holistic development.

Programme Educational Objectives (PEO)

To enable students to:

1. Understand the methods and techniques of production, processing, preservation, packaging and labeling, safety and quality assurance of different foods.
2. Gain knowledge in development of new food products and evaluation in terms of physical, chemical, microbiological, safety attributes, sensory and shelf life.
3. Acquire skills in food formulations, processing, preservation and evaluation of foods for their safety with reference to standards nationally and globally.
4. Apply of food processing and preservation technologies in research and food industry.

**CHOICE BASED CREDIT SYSTEM (C.B.C.S) SYLLABUS AND SCHEME OF EXAMINATION
(WITH EFFECT FROM THE ACADEMIC YEAR 2021-22 Onwards)
MS FOOD TECHNOLOGY (FT)**

I Semester

S. No	Components of the Study	Title of the course	Title of the paper	Credit Hrs/ Week	No. of credit	IA Marks	Sem End Exam Marks	Total
1	Core	FT 101	Food Chemistry and Analysis	6	4	20	80	100
2	Core	FT 102	Cereals, Legumes and Oil seed Technology	6	4	20	80	100
3	Compulsory Foundation	FT 103-A	Food Science and Experimental Foods	6	4	20	80	100
		FT 103-B	Baking Technology	6	4	20	80	100
4	Elective Foundation	FT 104-A	Community Nutrition	6	4	20	80	100
		FT 104-B	Nutrition during life span	6	4	20	80	100
5	Practical -I	FT 105	101+103-A/103-B	3+3/3	4	--	--	100
6	Practical -II	FT 106	102+104-A/104-B	3+3/3	4	--	--	100
Total						24		600
7	FT 107: Human Values and Professional Ethics-I (Audit course*)			0	0	100	0	0

*Audit Course – Zero credits under self- study

II Semester

S. No	Components of the Study	Title of the course	Title of the paper	Credit Hrs/ Week	No. of credit	IA Marks	Sem End Exam Marks	Total
1	Core	FT 201	Fruit and Vegetable Technology	6	4	20	80	100
2	Core	FT 202	Dairy Technology	6	4	20	80	100
3	Compulsory Foundation	FT 203-A	Food Microbiology and Safety	6	4	20	80	100
		FT 203-B	Nutrition in Emergencies And Disaster Management	6	4	20	80	100
4	Elective Foundation	FT 204-A	Research Methodology	6	4	20	80	100
		FT 204-B	Statistics and Computer Applications	6	4	20	80	100
5	Practical -I	FT 205	201+203-A/203-B	3+3/3	4	--	--	100
6	Practical - II	FT 206	202+204-A/204-B	3+3/3	4	--	--	100
Total						24		600
7	FT 207: Human Values and Professional Ethics-II (Audit course*)			0	0	0	100	0

*Audit Course – Zero credits under self-study

III Semester

S.No	Components of the Study	Title of the course	Title of the paper	Credit Hrs/	No. of credit	IA Marks	Sem End Exam	Total
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				Week			Marks	
1	Core	FT 301	Food Processing and Preservation Technology	6	4	20	80	100
2	Core	FT 302	Live stock and Sea Food Technology	6	4	20	80	100
3	*Generic Elective	FT 303-A	Technology of Spices, Condiments and Plantation crops	6	4	20	80	100
		FT 303-B	Basics of Food Engineering					
4	Practicals	FT 304	301+302	6	4	--	--	100
5	**Skill Oriented Course	FT 305	Food Industry Management (T) + (Practicals)	3+6	4	10	90 (40+50)	100
6	***Open Elective	FT 306-A	Fundamentals of Food, Nutrition and Health	6	4	20	80	100
		FT 306-B	Dynamics in Food Preparation					
Total					24			600

*Generic Elective – Student has to choose any one paper

**Internship is mandatory

***Open Elective – Offered by Department to other Department students

Note: Interested student may register for MOOCS with the approval of DDC

IV Semester

S.No	Components of the Study	Title of the course	Title of the paper	Credit Hrs/ Week	No. of credit	IA Marks	Sem End Exam Marks	Total
1	Core	FT 401	Food Safety Standards and Quality Control	6	4	20	80	100
2	Core	FT 402	Food Product Development and Marketing	6	4	20	80	100
3	*Generic Elective	FT 403-A	Nutrition for Health and Fitness	6	4	20	80	100
		FT 403-B	Unit Operations in Food Industry					
4	Practicals	FT 404	401+402	6	4	--	--	100
5	Multi Disciplinary Course/Project Work	FT 405	Technology of Packaging (T+P)	3+6	4	--	--	100
6	**Open Elective	FT 406-A	Child Welfare Programmes	6	4	20	80	100
		FT 406-B	Disaster Management					
Total					24			600

*Generic Elective- Student has to choose any one.

**Open elective –Offered by Department to other department Students.

Note: Interested students may register for MOOCS with the approval of DDC.

I SEMESTER

**DEPARTEMNT OF HOME SCIENCE
M S FOOD TECHNOLOGY
CHOICE BASED CREDIT SYSTEM (CBCS)**

(With effect from academic year 2021-22 onwards)

SEMESTER I

FT-101: FOOD CHEMISTRY AND ANALYSIS

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

CORE –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. Polysaccharide's – 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.

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 Distributors, Pvt. Ltd.

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

CO 1 Acquire knowledge on the physico chemical properties of compounds in foods.

CO 2 Apply the functional properties of foods in processing and preservation.

CO 3 Perform skills in qualitative and quantitative estimation of nutrients in different foods.

CO 4 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	PSO1	PSO2
CO1	3	3			2	2							3	
CO2	3	3			2	3							3	
CO3	3				3	3		1				1	3	3
CO4	3				2	2		1				1	3	3

High-3, Medium-2, Low-1

SRI VENKATESWARA UNIVERSITY::TIRUPATI
Model Question paper
M.Sc., (Home Science) Degree Examination
First Semester
(Specialization: MS Food Technology)
(CBCS for the students admitted from 2021-22 onwards)
Paper-I: FT - 101: FOOD CHEMISTRY AND ANALYSIS
(Common paper for MS Food Technology and M.Sc.Food Science Nutrition and Dietetics)

Time: 3 hours

Max Marks:80

SECTION- A

Answer any FOUR of the Following
Each question carries 5 marks

Marks: 4x5=20

1. Differentiate free, bound and entrapped water.
2. What are emulsions? Explain.
3. What is Pectin and write the properties.
4. Write the principle and application of Electrophoresis.
5. Explain the Chemistry of frying in foods.
6. Explain the hydrogenation of fats.
7. What are Amylose & Amylopectin and draw the structure.
8. Write any two identification tests of amino acids?

SECTION- B

Answer ALL questions
Each Question carries 15 MarksMarks: 4x15 =60

- 9.(a). Describe the determination of moisture in foods.
(or)
(b).Write the characteristics of colloids.

10. (a).Discuss the physical & chemical properties of lipids?
(or)

(b). Give the classification and discuss the physico- chemical properties of carbohydrates

11.(a). Explain the chemistry of hydration and dough formation of proteins.

(or)

(b). Classify proteins with suitable examples and write about protein denaturation.

12. (a). Explain the principle and estimation of protein by microkjeldahl method ?

(or)

(b). Write the principle and applications of GC/ MS.

FT-102: CEREAL GRAINS, LEGUMES AND OILSEED TECHNOLOGY

Course Objectives- To enable the students to:

1. Know the structure and composition of cereal grains, pulses and oil seeds.
2. Learn Post harvest technology and processing of cereals, pulses and oilseeds
3. Understand the mechanism of the equipment, Machinery and tools required for processing of cereals, pulses and oilseeds
4. Prepare and evaluate Traditional and commercially processed foods with cereals, pulses and oilseeds

CORE-THEORY

UNIT-1: Cereals and Millets

- Structure and Composition of Cereals and Millets.
- Milling Technology - Small scale, large scale, Turbo milling process.
- Parboiling, Popping, flaking, Malting and Fermentation process of cereal grains.
- Biproducts, Breakfast cereals and RTE foods, Enrichment, Fortification.
- Physico chemical changes during soaking, germination, heating and malting.
- Value addition and Health benefits of millets.

UNIT- II: Pulses and Legumes

- Structure and Composition of Pulses and Legumes.
- Milling Technology - General Milling of Pulses and Legumes. Soaking and Germination. Products, Biproducts and Value-added products.
- Soya bean – Processing, soya isolates, soya concentrates and soya products.

UNIT-III: Nuts and Oil Seeds

- Structure and Composition of Nuts and Oil seeds.
- Milling Technology – Processing, Extraction, Refining and Hydrogenation of Nuts and oilseeds.
- Biproducts and Value-added products of nuts and oil seeds.

UNIT-IV: Post Harvest Technology

- Post harvest losses, spoilage, causative factors, prevention and control measures.
- Equipment- machinery and tools required for processing of cereals, legumes, nuts and oil seeds.
- Quality control standards for Cereals, Legumes, Nuts and Oil seeds.

REFERENCES

1. Norman N Potter. (2007). *Food Science*, Fifth edition, An Aspen Publication, Mariland.
2. Peter C Morris and James H Bryce.(2004). *Cereal Biotechnology*, First Edition, Wood head publishing limited, Cambridge, England.
3. Subba Lakshmi G, and Shobha A. Udipi.(2001). *Food Processing and preservation*, New Age International (P) Ltd Publishers, New Delhi.
4. VijayaKhader. (2001). *Text Book of Food science and Technology*, Directorate of Information and publications of Agriculture, Indian Council of Agricultural Research, New Delhi.
5. Edwards, W.P.(2007). *The science of Bakery Products*, The Royal Society of Chemistry, Thomas Graham House, Cambridge.
6. Fast R.B. and Caldwell E.F. (1990). *Breakfast cereals and how they are made?*, American Association of Cereal Chemists" St Paul. MN.

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

CO1 Gain knowledge about basic composition and structure of cereal grains, pulses and oil Seeds.

CO2 An in-depth understanding of the science and technology associated with Post-harvest technology and processing of cereals, pulses and oilseeds.

CO3 Able to operate and handle the equipment, Machinery and tools required for processing of cereals, pulses and oilseeds.

CO4 Prepare various food products including the by-products of cereal grains, pulses and oil Seeds.

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	3	3
CO3	3				3	2						3	3	3
CO4	3		3		3				2	3	3	3	3	3

High-1, Medium-2, Low-3

SRI VENKATESWARA UNIVERSITY::TIRUPATI
Model Question paper
M.Sc (Home Science) Degree Examination
First Semester
(Specialization: MS Food Technology)
(CBCS for the students admitted from 2021-22 onwards)
Paper-II: FT- 102: CEREAL GRAINS, LEGUMES AND OIL SEED TECHNOLOGY

Time : 3 hours

Max Marks:80

SECTION- A

Answer any FOUR of the Following

Each question carries 5 marks

Marks: 4x5=20

1. Write the Physico chemical properties of cereal and millets?
2. Explain small scale milling process of cereals?
3. Explain about products, biproducts and value added products of pulses and legumes?
4. Write a short note on germination?
5. Briefly explain about the various extraction methods of oil seeds?
6. Draw the structure of any oil seed and write its composition?
7. Write the causative factors of post harvest losses?
8. Mention the Machinery and its function for processing of legumes.

SECTION- B

Answer ALL questions

Each Question carries 15 Marks

4x15 =60 Marks

9. (a).Give an detailed account on turbo milling process of cereals and millets.
(or)
(b). Write the principle of baking and explain the role of ingredients in baking?

10. (a). Explain the physico chemical properties and composition of pulses and legumes?
(or)
(b). Discuss the processing of soya isolates and concentrates??
11. (a). Discuss about refining and hydrogenation of nuts and oil seeds?
(or)
(b). Explain the value added products of nuts and oil seeds?
12. (a). Discuss about post harvest losses at various stages?
(or)
(b). Write in detail about quality control standards of cereals, millets and pulses?

FT-103-A: FOOD SCIENCE AND EXPERIMENTAL FOODS
(Common to MS Food Technology and M.Sc. Food Science Nutrition & Dietetics Course)

Course Objectives - To enable the students to:

1. Acquiree 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. Apply knowledge about different processing techniques on nutritive quality of foods.
4. Apply skills in standardisation of foods using different processing techniques.

COMPULSORY FOUNDATION- THEORY

UNIT-I: Foods of Plant Origin

- Cereals and Millets: Structure, Composition and functional properties.
- Pectin and Gums: Functional role in food products and its applications.
- Baking process: Cereal flours, Flour mixes dough and batter, Leavening agents, role of ingredients in baking process.

- Pulses and Legumes: Composition, anti-nutritional factors, Effect of cooking.
- Vegetables and Fruits: Classification, Composition, Pigments and Flavors constituents - Cooking effect, Browning reaction.

UNIT-II: 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 and Composition and cooking.

UNIT-III: Starch, Sugars and Fats

- Starch: Characteristics, Gelatinization, Factors affecting gelatinization, modified food starches-Applications.
- 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.

UNIT-IV: Sensory Evaluation

- Sensory Attributes of food quality and its characteristics.
- Requirements to conduct sensory evaluation- Sensory panel, Preparing and Presenting Samples for Testing, Panel booth.
- Sensory Tests – Analytical and Affective Tests.

REFERENCES

1. Vaclavik, V. A., Christian, E. W., & Campbell, T. (2008). *Essentials of food science* (Vol. 42). New York: Springer.
2. Khatkar, B. S. (Ed.). (2007). *Food Science and Technology*. Daya Books.
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6. SethiMohini.(2011).*Food Science: Experiments and Application*, second edition, Jain book Agency, New Delhi.
7. N.ShakuntulaManay& M. Shadaksharswamy. (2001).*Foods- Facts and Principles*, second edition, New Age International Publishers, New Delhi.
8. 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. Standardize the weights and measures of various food items.
- CO 3. Demonstrate the role of ingredients in cookery.
- CO 4. Apply different techniques in evaluation of food.

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

SRI VENKATESWARA UNIVERSITY: TIRUPATI

Model Question paper

M.Sc (Home Science) Degree Examination

First Semester

(Specialization: MS Food Technology)

(CBCS for the students admitted from 2021-22 onwards)

Paper-III:FT-103-A: FOOD SCIENCE AND EXPERIMENTAL FOODS

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

Time:3 hours

Max Marks: 80

SECTION- A

Answer any FOUR of the Following

Each question carries 5 marks

4x5=20Marks

1. What are leavening agents and write its importance in baking process?
2. Classify fruits and vegetables and write its nutrient composition?
3. Explain the structure of egg?
4. Explain the functional properties of milk?

5. What are modified food starches? Explain.
6. Describe different types of sugars and sugar syrups?
7. Define sensory evaluation and write the requirements for it?
8. Write the factors should be considered in selecting sensory panel for evaluation?

SECTION- B

Answer ALL questions

Each Question carries 15 Marks

4x15 =60 Marks

- 9.(a). Write the composition of pulses and legumes and explain the different methods to decrease the anti-nutritional content present in pulses?
(or)
(b).Discuss in detail about various pigments and flavor constituents present in fruits and vegetables?
- 10.(a).Write in detail about the composition and kinds of milk ?
(or)
(b).Draw the structure of muscle and explain the post mortem changes occurred in meat?
- 11.(a). What is gelatinization? Explain about various factors that affect gelatinization process?
(or)
(b).Explain the different functional properties of fats and their applications in food?
12. (a).Explain in detail about analytical tests in food evaluation ?
(or)
(b). Discuss about sensory attributes and explain the affective tests?

FT 103-B: BAKING TECHNOLOGY

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

Course Objectives: To enable the students to:

1. Understand the concept and technology of baking.
2. Learn the role of different ingredients in baking process
3. Familiarize with processing techniques of various bakery products
4. Develop skills in organizing and maintenance of a baking industry.

GENERIC ELECTIVE - THEORY

UNIT-I: Bakery Industry

- Introduction, current status, growth rate, and economic importance of Bakery Industry in India.
- Baking: Principles, baked foods, Baking temperatures, Knowledge and working of various types of oven, baking equipment; Roasting: Principles of roasting, roasting equipment;

- Formulations, processing (mixing, fermentation, rounding, proofing, sheeting, moulding, baking, depanning etc.), equipments, packaging, storage and quality testing of bakery products

UNIT-II: Baking Technology

- Types and grades of wheat flour, Wheat flour proteins and importance of gluten in manufacture of bakery products.
- Role of ingredients in bakery products- sugars, fats, leavening agents, additives and other ingredients.
- Types of Bakery Products and Technology for their Manufacture – dough and batters; Dough rheology.

UNIT-III: Bakery Products

- Hard wheat Products: bread- Ingredients, various types of bread, equipments and types of mixing methods, preparation of bread, Product quality characteristics, faults and corrective measures of bread.
- Soft wheat Products: cookies, crackers, biscuits– Ingredients, types, equipments, method of preparation, Product quality characteristics, faults and corrective measures.
- Ingredient used in Cake Making, types and varieties, equipments, cake making methods, Product quality characteristics, faults and corrective measures of cakes.
- Other bakery products: using very hard wheat. Pizza, pastry and its types.

UNIT- IV: Modified Bakery Products

- Modified bakery products: high fiber, low sugar, low fat, gluten free bakery products.
- Decoration of baked foods – Icing and Fillings, its types and applications in bakery. Role of other ingredients used in icing and fillings.
- Staling and Nutrient Losses in Bakery Products.

REFERENCES

1. Dubey, S.C. (2007). Basic Baking 5th Ed. ChanakyaMudrak Pvt. Ltd.
2. Manay, S. & Shadaksharaswami, M. (2004). Foods: Facts and Principles, New Age Publishers
3. Hebeda, R. (Ed.). (1996). *Baked goods freshness: Technology, evaluation, and inhibition of staling* (Vol. 75). CRC Press.
4. Manley, D. (Ed.). (2011). *Manley's technology of biscuits, crackers and cookies*. Elsevier.
5. Vaclavik, V. A., Christian, E. W., & Campbell, T. (2008). *Essentials of food science* (Vol. 42). New York: Springer.

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

CO1 Acquire knowledge on bakery industry and products.

CO2 Comprehend the technology of processing of bakery products.

CO3 Demonstrate the skills in various types of bakery items.

CO4 Comprehend the technology of processing in handling the bakery.

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
CO2	3		3		2		3	2	3		3	3		3

CO3	3		3		3	3				1	3		3	3
CO4	2		3			3	3		2		3	3	3	

High-3, Medium-2, Low-1

SRI VENKATESWARA UNIVERSITY::TIRUPATI
Model Question paper
M.Sc(Home Science) Degree Examination
First Semester
(CBCS for the students admitted from 2021 onwards)
Paper:III- FT: 103-B: BAKING TECHNOLOGY
(Common to MSc Food Science Nutrition & Dietetics and MS Food Technology Course)

Time: 3 hours

Max Marks: 80

SECTION- A

Answer any FOUR of the Following

Each question carries 5 marks:

Marks: 4x5=20

1. Write the economic importance of bakery industry.
2. Principal of Baking.
3. Write the types of wheat flour.
4. Differentiate dough and batter.

5. Briefly write about cookies preparation procedure.
6. List down the hard and soft wheat bakery products.
7. Write the types of fillings and icings.
8. Short note on gluten free bakery products

SECTION- B

Answer ALL questions

Each Question carries 15 Marks

Marks:4x15 =60

9. (a) Explain the various equipments used in bakery processing and its importance.

(Or)

- (b) Discuss the importance of packaging and quality factors of bakery products.

10. (a) Enumerate the importance of various ingredient used in bakery.

(Or)

- (b) Explain various rheological properties associated with bakery items.

11. (a) Explain in detail about bread processing and its types.

(Or)

- (b) Discuss about common faults and Corrective measures in bread and cakes.

12. (a) Write the common reasons for nutrient losses in bakery products.

(Or)

- (b) Explain in detail about various decorative items in bakery and its preparation.

104-A: COMMUNITY NUTRITION

(Common to all specializations of M ScHome Scienceand MS Food Technology course)

Course Objectives- To enable the students to:

1. Know about nutrients in 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 assess the nutritional status of different age groups.

ELECTIVE FOUNDATION – THEORY

UNIT-I: Food Composition - Grouping

- Food Groups – Classification – food composition
- 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.
- Menu planning– Definition, Principles, Factors affecting menu planning

UNIT – II: Assessment of Nutritional Status of the Community:

- Need - Methods of Assessment - (a) Direct Methods - (i) Diet Surveys (ii) Anthropometric Assessment - (iii).clinical and (iv). Biochemical Assessment
- (b) Indirect Methods - Vital Statistics - Merits and Demerits of methods -
- Nutrition surveys - longitudinal and cross sectional - Family, individual and institutional surveys - Techniques for assessment of age - use of reference standards for the assessment of nutritional status.

UNIT – III: Major Nutrition Problems of the Community:

- Nutrition Through Life Span – Infancy, Early and late childhood, Adolescence, Adulthood and Ageing – Nutritional requirements and Recommended Dietary Allowances (RDA)– Justification for special needs during periods of growth and development, pregnancy and lactation – significance of breast feeding –
- Malnutrition and under nutrition- PEM/CED, obesity- deficiencies vit-A, iron /iodine - Etiology –Symptoms - Government programmes to eradicate PEM, vitamin-A, Iron and Iodine deficiencies – Principles of planning diets for different conditions of malnutrition

UNIT – IV: Strategies to Combat Malnutrition:

- Food security – Definition – Management of food insecurity - -Food Fortification and enrichment-
- Food Assistance and Food Supplementation - Policies and Programmes of the Government - Governmental Policies and Programmes - Food Assistance and Food Supplementation Programmes - Public Distribution System (PDS) - Food For Work (FFW), Special Nutrition Programme (SNP), School Lunch Programme (SLP), Mid Day Meal Programme (MMP), Balawadi Nutrition Programme (BNP), Integrated Child Development Services (ICDS) -
- Nutrition Education - Importance - Approaches Media and Methods

REFERENCES

1. Davidson and Passmore R., Brock, J.F., and Truswell, A.S. (1979). *Human Nutrition and Dietetics*, 7th ed. New York. Churchill Living stone.
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*
7. Suitor, C.W. and Hunter, M.F. (1980).*Nutrition principles and application in health promotion*, J.B. Lippincot Company, Philadelphia
8. 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 the nutritional problems of the community.

CO 2 Acquire knowledge about food groups, RDA and steps in planning a diet.

CO 3Skills in planning and calculating nutritive values for different nutritional disorders.

CO 4Understand the skills in assessing the nutritional status by different methods for different age groups.

CO-PO Mapping

Course	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

SRI VENKATESWARA UNIVERSITY: TIRUPATI
Model Question paper
M.Sc (Home Science) Degree Examination
First Semester
(Specialization: MS Food Technology)
(CBCS for the students admitted from 2021-22 onwards)
Paper-IV:104-A: COMMUNITY NUTRITION

(Common to MS Food Technology and all three specializations of Home Science)

Time: 3 hours

Max Marks:80

Part- A

Answer any FOUR of the Following

Each question carries 5 marks

(4 x5=20Marks)

1. Describe classification of foods with functions.
2. Write a short note on recommended dietary allowances.
3. Define Vital Statistics
4. Write short note on Nutritional assessment
5. Significance of breast feeding
6. Clinical symptoms of Vitamin A & C deficiencies
7. Describe Mid-Day Meal programme.
8. What is Public distribution system

Part- B

Answer ALL questions

Each Question carries 15 Marks

(4x15=60 Marks)

9. (a) Explain about food groups, food composition and nutritive value of different foods.

(or)

(b) Define meal planning, principles and factors affecting meal planning.
10. (a).Describe briefly the methods of anthropometric measurements in altering nutritional status of the community.

(or)

(b).Explain the advantages and disadvantages of the Biochemical method of assessment of nutritional status.
11. (a) Discuss physiological changes that occur during pregnancy and state the nutritional requirements during pregnancy.

(or)

(b). State the RDA for an adolescent girl. Plan a menu and give justification.

12. (a) Discuss about food security, food fortification and enrichment.
(or)
(b) Write in detail about ICDS.

104-B:NUTRITION DURING LIFE SPAN

(Common to all specializations of M Sc Home Science and MS Food Technology course)

Course Objectives - To enable the students to:

1. Gain knowledge on the importance of nutrition during life span
2. To do computation of nutrient allowances during life span.
3. Enlighten the principles and working applications during dietary modifications.
4. Comprehensive knowledge on analysing the nutritional requirements.

COMPULSORY FOUNDATION 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 For 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.

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	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

SRI VENKATESWARA UNIVERSITY::TIRUPATI
Model Question paper
M.Sc., (Home Science) Degree Examination
Fourth Semester
(CBCS for the students admitted from 2021-22 onwards)
Paper: FT 104-B: NUTRITION DURING LIFE SPAN
(Common to all specializations of M Sc Home Science and MS Food Technology course)
Time: 3 Hrs **Max: 80 Marks**

Part – A

Answer any four questions
Each question carry equal marks **(4X5=20 Marks)**

1. Write the effects of lactation on nutritional composition of Human milk.
2. What are the factors that affect the breast milk quality?
3. Explain the need for infant formulae.
4. Discuss the importance of nutrition during Pre-school children.
5. Write the nutritional issues in Adolescence.
6. Discuss the Nutritional requirements in School-going children.
7. Write the effects of aging on nutritional health.
8. Explain the nutritional concerns in old age and their management pregnancy outcome.

Part – B

Answer all questions
Each question carry equal marks **(4X15 = 60 Marks)**

9. (a). Explain about Nutritional intervention and pregnancy outcome & write the advantage and disadvantages of breast and formulae feeding.
(Or)
(b). Discuss about the nutritional requirements during pregnancy and lactation? Write about common complications and problems.

10. (a).What are the effects of macro & micro nutrient malnutrition on physical and mental health?
(Or)
(b). Discuss about various types of Infant formulas and common problems during infancy.
11. (a). Explain the importance of nutritional requirement and RDA and discuss the importance of implications of child obesity.
(Or)
(b). Write in detail about various physiological problems during adolescence.
12. (a).Discuss the modification in diet, feeding old people. Nutritional requirement for adult man and woman.
(Or)
(b). Explain the principles to be considered while planning and preparation of diets of elderly.

**PRACTICAL-1: FT-105: FOOD CHEMISTRY AND ANALYSIS & FOOD SCIENCE
AND EXPERIMENTAL FOODS/ BAKING TECHNOLOGY**

FT-101: FOOD CHEMISTRY AND ANALYSIS

Course Objectives

1. Know the principles and working applications of different analytical techniques associated with food.
2. Comprehensive knowledge on techniques of analysing the nutrient components in foods.

PRACTICALS:

1. Volumetric analysis of Acids and Bases
2. Determination of Moisture
3. Qualitative analysis of Carbohydrates, Hydrolysis of Starch.
4. Determination of starch and sugars
5. Qualitative analysis of Proteins and Amino acids
6. Estimation of proteins - Micro-Kjeldahl method
7. Qualitative analysis of fats and oils.
8. Determination of fat in solid and liquid foods.
9. Determination of Total ash
10. Estimation of Calcium
11. Estimation of Phosphorus
12. Estimation of Iron
13. Estimation of Vitamin C

Course Out comes

CO 1 Perform skills in qualitative and quantitative estimation of nutrients in different foods.

CO 2 Describe the chemical components and their functions in Food applications.

FT-103-A: FOOD SCIENCE AND EXPERIMENTAL FOODS

Course Objectives

- Acquire Knowledge on different processing techniques on nutritive quality of foods.
- Knowledge on standardisation of foods for different processing techniques.

PRACTICALS:

1. Standardization of weights and measures of various foods
2. Starch cookery- Structure, gelatinization and factors affecting gelatinization
3. Baking –Determination of gluten content, Preparation of plain cake and evaluation by subjective and objective methods.
4. Pulse cookery – effect of different cooking methods
5. Vegetable and fruit – Effect of time, temperature, media and cooking methods on pigments, Enzymatic Browning- Preventive measures.
6. Sugar cookery- stages of sugar cookery and its application in Indian sweet making, fondant preparation.
7. Fats and oils – Smoke points, oil absorption and mayonnaise preparation.
8. Milk cookery - factors affecting milk cookery- Temperature, pH, acid, base, coagulation factor.
9. Egg and Meat cookery – Egg white foams, methods of cooking egg and Meat, role of tenderizers in meat cooking.
10. Sensory Evaluation of food- preparation of score card, threshold tests, sensory testing.

Course Out Comes

CO 1 Demonstrate the role of ingredients in cookery.

CO 2 Apply different techniques in evaluation of food.

FT 103-B: BAKING TECHNOLOGY

Course Objectives:

1. To understand the concept and role of ingredients in technology of baking.
2. Familiarize with processing techniques of various bakery products

PRACTICALS:

1. Introduction of tools and equipment's of bakery products.
2. Determining the gluten content.
3. Preparation of Biscuits and Cookies.
4. Preparation of Doughnuts and Muffins.
5. Preparation of Bread and Bun.
6. Preparation of Pizza.
7. Preparation of various Types of Cakes.
8. Preparation of Filling and Icings.

Course Outcomes -

- CO1** Acquire knowledge on bakery industry and handling the bakery products.
CO2 Demonstrate the skills in various types of bakery items.

PRACTICAL-II: FT-106: CEREAL GRAINS, LEGUMES AND OILSEED TECHNOLOGY & COMMUNITY NUTRITION/ NUTRITION DURING LIFE SPAN

FT-102: CEREAL GRAINS, LEGUMES AND OILSEED TECHNOLOGY

Course Objectives

- To gain knowledge on various processing techniques of cereals, legumes and oilseeds
- To acquire knowledge in various food applications and product preparations.

PRACTICALS:

1. Market survey on cereals, legumes, nuts, oil seed grains and their products.
2. Effect of Soaking, germination and malting process of Cereals on Physical and functional properties.
3. Popping and flaking.
4. Fermentation processing of cereals and pulses.
5. Flour Analysis.
6. Baking- Bread and biscuit making and evaluation of physical and chemical attributes.
7. Effect of Soaking, germination and malting process of Pulse and legume on Physical and functional properties.
8. Preparation and evaluation of peanut butter.
9. Preparation and evaluation of ready to eat breakfast foods.
10. Visit to food industry.

Course Outcomes

- CO1 Able to identify and handle various processing techniques.
- CO2 Hands on experience in product preparations.

FT-104-A: COMMUNITY NUTRITION

Course Objectives

1. To Understand the consequences of deficiency and menu planning.
2. To gain knowledge about the different methods of nutritional assessment.

PRACTICALS:

1. Assessment of Nutritional Status using Anthropometry,
2. Assessment of Nutritional Status using Dietary method
3. Planning of Diets for Different Nutritional Deficiencies like PEM, Anemia, Vit-A.
4. Planning and Preparation of Programmes for Significant Days like Breast Feeding Week, Nutrition Week, World Food Day.
5. Study of the following through visits
 - Govt School Lunch Programme

- ICDS Programme
- Anganwadi Training Centers.
- 6. School Lunch Programme at Sri Venkateswara University Laboratory Nursery School.
- 7. Community Nutrition Programme Planning - Introduction, Identification of problem, nutritional assessment, analysis of causes, resources, constraints, selection of interventions, setting a strategy, implementations, evaluation of the programme

Course Out comes

- CO 1 Acquire knowledge about food groups, RDA and steps in planning a diet.
- CO 2 Skills in planning and calculating nutritive values for the foods and recipes.

FT-104-B: NUTRITION DURING LIFE SPAN

Course Objectives -

1. To acquire knowledge on principles and working applications during dietary modifications..
2. To enable the comprehensive knowledge on analyzing the nutritional requirements.

PRACTICALS:

1. Planning and preparation of diet during pregnancy.
2. Planning and preparation of diet during lactation.
3. Planning and preparation of weaning foods.
4. Planning and preparation of diet for pre-school children.
5. Planning and preparation of diet for school going children.
6. Planning and preparation of diet during adolescence.
7. Planning and preparation of diet for adults.
8. Planning and preparation of diet for old age.

Course Out comes-

CO1 Assess and compare diet and nutritional requirements relative to age, developmental and disease status.

CO2 Evaluate nutrition products for composition, quality, and appropriateness of use and formulate dietary interventions to address nutritional deficiencies.

FT-107: HUMAN VALUES AND PROFESSIONAL ETHICS – I
(Revised Syllabus with effect from 2021-22 onwards)

AUDIT COURSE

Course Objectives- This course helps the students to:

1. Define the term ‘ethics’ , ‘good and bad values’, crime and punishment and religious tolerance.
2. Understand the importance of good character, conduct and values embedded in various religions.
3. Apply knowledge of professional ethics and correlate the concepts in addressing the ethical issues outside the class room.
4. Demonstrate knowledge of ethical values in non-class room activities, internships and field work and resolve the moral issues.

AUDIT COURSE-THEORY

UNIT-I:

- Definition and Nature of Ethics- Its relation to Religion, Politics, Business, Legal, Medical and Environment.
- Need and Importance of Professional Ethics - Goals - Ethical Values in various Professions.

UNIT-II:

- Nature of Values- Good and Bad, Ends and Means, Actual and potential Values, Objective and Subjective Values, Analysis of basic moral concepts- right, ought, duty,

obligation, justice, responsibility and freedom.

- Good behavior and respect for elders, Character and Conduct.

UNIT-III:

- Ahimsa (Non- Violence), Satya (Truth), Brahmacharya (Celibacy), Asteya (Non- possession) and Aparigraha(Non- stealing).
- Purusharthas(Cardinal virtues)-Dharma (Righteousness), Artha(Wealth), Kama(Fulfillment Bodily Desires). Moksha(Liberation).

UNIT-IV:

- Bhagavad Gita- (a) Niskama karma. (b) Buddhism- The Four Noble Truths – AryaAstangamarga, (c) Jainism- mahavrata and anuvratas.
- Values Embedded in Various Religions, Religious Tolerance, Gandhian Ethics.
- Crime and Theories of punishment- (a) Reformative, Retributive and Deterrent. (b) Views on manu and Yajnavalkya.

REFERENCES

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2. "The Ethics of Management" by Larue Tone Hosmer. Richard D. Irwin Inc.
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4. "Ethics in Management" by S.A. Sherlekar, Himalaya Publishing House.
5. Harold H. Titus: Ethics for Today Maitra, S.K: Hindu Ethics .
6. CarakaSamhita :Tr.Dr. Ram Karan Sarma and VaidyaBhagavan Dash, Chowkamba Sanskrit Series office. Varanasi I, 11.111 VolIPP 183-191.
7. Ethics, Theory and Contemporary Issues. Barbara Mackinnon Wadsworth/Thomson Learning, 2001.
8. Analyzing Moral.Issues, Judith A. Boss. May Field Publishing Company - 1999.
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10. Text Book for Intermediate First Year Ethics and Human Values. Board of Intermediate Education- Telugu ~ Akademi, Hyderabad.

Course Outcomes:After studying the course, students will able to:

CO1 Define the term ‘ethics’, ‘good and bad values’, crime and punishment and religious tolerance.

CO2 Understand the importance of good character, conduct and values embedded in various religions.

CO3 Apply knowledge of professional ethics and correlate the concepts in addressing the ethical issues outside the class room.

CO4Demonstrate the ability to face difficult situations in non-class room activities, Internships and field work and resolve them confidently.

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

SRI VENKATESWARA UNIVERSITY:: TIRUPATI

Model Question Paper

M.Sc. (Home Science) Degree Examination

First Semester

(Specialization – **Food Technology**)

(CBCS for the students admitted from 2021-22 onwards)

FT - 107 :HUMAN VALUES AND PROFESSIONAL ETHICS - I

Time: 3 Hrs

Max: 100 Marks

Part – A

Answer any four questions

Each question carry equal marks

(4X5=20 Marks)

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

Part – B

Answer all questions

Each question carry equal marks

(4X15 = 60 Marks)

9. a)

(Or)

b)

10. a)

(Or)

b)

11. a)

(Or)

b)

12. a)

(Or)

b)

II SEMESTER

**DEPARTEMNT OF HOME SCIENCE
M S FOOD TECHNOLOGY
CHOICE BASED CREDIT SYSTEM (CBCS)
(With effect from academic year 2021-22 onwards)
SEMESTER II**

FT-201: FRUIT AND VEGETABLE TECHNOLOGY

Course Objectives

To enable the students to:

1. Attain an overview on the classification and composition of fruits and vegetables
2. Acquaint with the post-harvest handling technologies of fruits and vegetables to reduce postharvest losses and their value addition.
3. Equip with the knowledge of processing and preservation of fruits and vegetables.
4. Impart the expertise in Production and manufacture of fruits and vegetable based food products and preserves

CORE –THEORY

UNIT-I: Fruits and Vegetables

- Production and processing scenario of fruits and vegetables in India and world.

- Morphology, Structure, Classification of fruits and vegetables; Composition and Nutritive value of fruits and vegetables: Maturity Indices and standards for fruits and vegetables; Methods of maturity determination.
- Standards and specifications for fresh fruits and vegetables of Indian origin.

UNIT-II: Post Harvest Handling of Fruits and Vegetables

- Importance and scope of post harvest management, Factors affecting post harvest losses.
- Post-harvest physiological and biochemical changes in fruits and vegetables; Ripening of climacteric and non-climacteric fruits.
- Physiological post harvest problems - Chilling injury and disease; Prevention of post harvest diseases and infestation.

UNIT-III: Storage, Transportation and Handling

- Methods and storage practices- Controlled atmosphere storage, Modified atmosphere packaging, Hypobaric storage, Pre cooling and Cold storage, Zero energy cool chamber; Commodity pretreatments - Chemicals, Coatings, Prepackaging, Vapor Heat Treatment.
- Post Harvest Handling operations; Cleaning: Cleaning and washing of fruits and vegetables, types of cleaners, screens, types of screens, rotary screens, vibrating screens, machinery for cleaning of fruits and vegetables (air cleaners, washers). Sorting and grading: Sorting, grading, methods of grading- Size grading, color grading, specific gravity grading.

UNIT-IV: Fruit and Vegetable Products

- **Fruit Products:** Definition-Manufacturing Process-Quality Standards and Specifications of: Fruit Beverages, Jams, Jellies, Marmalades, Puree, Concentrates, Preserves, Candied Fruits, Bars, Toffees, Dehydrated Fruits.
- **Vegetable Products:** Definition-Manufacturing Process-Quality Standards and Specifications of: Vegetable Products-Pickles, Chutneys, Sauces, Tomato juice, Tomato puree, Paste, Ketchup, Sauce, Soup, Dehydrated vegetables.

REFERENCES

1. VijayaKhader. (2004). *Preservation of fruits and Vegetables*, 2nd edition, Kalyani publishers, Ludhiana.
2. GirdhariLal, G.S. Siddappa& G.L. Tandon. (1998). *Preservation of Fruits and Vegetables*. ICAR, New Delhi.
3. Srivastava.P.R. andSanjeev Kumar. *Fruit and vegetable preservation - 3rd Edition*. International Publishers, Delhi.
4. Shrivastava, A. K. (2004). *Agriculcture and Food*, 1st edition, APH publishing corporation, New Delhi

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

CO1Application of Post-Harvest handling technologies to reduce the postharvest losses.

CO2Learn the processing and preservation methods to prevent the spoilage of Fruit &vegetables.

CO3Develop various Fruits & vegetables based products and preserves

CO4Assess the quality of fruit and vegetables and their products.

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

High- 3, Medium- 2, Low- 1

SRI VENKATESWARA UNIVERSITY::TIRUPATI

Model Question paper

M.Sc (Home Science) Degree Examination

(Specialization: MS Food Technology)

Second Semester

(CBCS for the students admitted from 2021-22 onwards)

Paper-I: FT-201: FRUIT AND VEGETABLE TECHNOLOGY

Time : 3 hours

Max Marks:80

SECTION- A

Answer any FOUR of the Following

Each question carries 5 marks

Marks: 4x5=20

1. Write the classification and composition of Vegetables?
2. Write about methods of maturity determination?
3. What are the factors affecting the Post harvest losses?
4. Differentiate between climacteric and non-climacteric fruits?
5. Describe methods of grading Size grading and specific gravity grading?
6. Explain the Zero energy cool chamber?
7. What are the defects in Fruit Preserve and Candied Fruit?

8. Define blanching and write the different methods of blanching?

SECTION- B

Answer ALL questions

Each Question carries 15 Marks 4x15 =60 Marks

9.(a). Production and processing scenario of fruits and vegetables in India.

(or)

(b). Explain the maturity indices and standards of fruits and vegetables?

10.(a). Post-harvest physiological and biochemical changes in fruits and vegetables.

(or)

(b). Write in detail about Prevention of post harvest diseases and infestation?

11.(a). Enumerate the unit operations in fruit and vegetable processing industry.

(or)

(b). Write about Controlled atmosphere storage, Modified atmosphere packaging, Hypobaric storage?

12.(a). Explain the manufacturing process of jam and write the quality standards?

(or)

(b). Explain the manufacturing process of pickles and write the quality standards?

FT- 202: DAIRY TECHNOLOGY

Course Objectives - To enable the students to:

1. Impart the knowledge of milk grading and their composition.
2. Illustrate the technologies of processing of milk and milk products.
3. Provide in-depth knowledge in various unit operations and developments in dairy processing.
4. Demonstrate the manufacturing of various dairy products and exemplify the quality of dairy products.

CORE-THEORY

UNIT-I: Milk Processing

- Milk - Definition, Structure, Composition, Factors affecting composition of milk.
- Collection and Transportation of milk - Reception, Sampling techniques, grading of milk, clarification, chilling at procurement site, Storage and Transportation.
- Processing - Homogenization, Pasteurization, sterilization, UHT processing of Milk.
- Cleaning and sanitization of equipments - cleaning methods and sanitization methods in dairy processing.

UNIT-II: Milk & Milk Products

- Types of Market Milk - Whole milk, Low fat milk, Toned and Double toned milk, Skimmed milk, Condensed milk, concentrated milk, Fortified and Double fortified milk, flavored milk.

- Fat-Rich Dairy Products - Definition, composition, standards and method of manufacture of Cream, Butter, Ghee, and butter oil.
- Traditional Indian Dairy Products - Standards and method of manufacture of Khova, Khova based sweets, chenna, chenna based sweets, panner, and kheer.
- Evaporated products -Standards, types and method of manufacture of Condensed and Dried Milks.

UNIT-III: Fermented, Frozen and By products of Milk

- Cheese - Definition, standards and classification of cheese, Manufacture of different varieties of cheese.
- Fermented Milk products - Types of starter cultures, Role of starters in the preparation of various fermented milks and Types of fermented products – dahi and yoghurt preparation.
- Ice cream - Definition, classification and composition and standards of ice cream and other frozen desserts, Stabilizers and emulsifiers-their classification.
- By products utilization - Various types of by-products, utilization of dairy by-products, processing and its application.

UNIT-IV: Advanced Technologies in Milk & Whey Processing

- Membrane techniques - classification and characteristics of filtration processes, types of membrane processing, applications of Ultra filtration, Mono filtration, Micro filtration, Reverse osmosis, ion exchange and electrodialysis processes.
- Application of Stabilizers, emulsifiers, immobilized enzymes and developments in dairyBio-technology.

REFERENCES

1. De, S. (1980). Outlines of dairy technology. *Outlines of dairy technology*.
2. Smit G. 2003. Dairy Processing – Improving Quality. CRC-Woodhead Publ.
3. Tamime, A. Y. (Ed.). (2008). *Structure of dairy products*. John Wiley & Sons.
4. Walstra, P. (1999). *Dairy technology: principles of milk properties and processes*. CRC Press.
5. Edgar, S., & Axel, M. (2017). *Milk and dairy product technology*. Routledge.

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

- CO1.** Gain knowledge of milk composition, types and grades of milk.
CO2. Comprehend the technology of processing of milk and milk products.
CO3. Apprehend the manufacturing and quality analysis of different dairy products.
CO4. Perceive hygiene and sanitation practices in dairy industry.

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		2	2	3							3	3	3
CO3	3	2	3		3	1		2	1	1	2	3	3	3
CO4	3	2						3		3	2	3	3	3

High-3, Medium-2, Low-1

SRI VENKATESWARA UNIVERSITY: TIRUPATI
Model Question paper
M.Sc (Home Science) Degree Examination
Second Semester
(Specialization: MS Food Technology)
(CBCS for the students admitted from 2021-22 onwards)
Paper-II- FT-202:DAIRY TECHNOLOGY

Time : 3 hours

Max Marks:80

SECTION- A

Answer any FOUR of the Following
Each question carries 5 marks

Marks: 4x5=20

1. Write the definition and composition of milk?
2. Types of pasteurization?
3. What is fortified and double fortified milk?
4. Write the Processing of cream?
5. Briefly discuss about fermented milk products?
6. List down stabilizers and emulsifiers used in ice creams?
7. Discuss the application of immobilized enzymes in dairy processing?
8. Explain the importance of membrane processing in milk industry?

SECTION- B

Answer ALL questions
Each Question carries 15 Marks

4x15 =60 Marks

9. (a). Give a detailed account on UHT processing and aseptic packaging of milk?

(Or)

(b). Explain about: milk reception, chilling, homogenization, storage and transport of milk?

10. (a). Enumerate the manufacturing process of Butter, ghee and butter oil?

(or)

(b). Write the definition, standards and method of manufacturing of khova, paneer and chenna?

11. (a). Define cheese? Write the classification and manufacturing process of cheese.

(or)

(b). Write the importance of dairy by product, their process and applications with examples.

12. (a). Enumerate the types of membrane processing and its applications with examples?

(or)

(b). Write in detail about ultra filtration, mono and micro filtration in whey processing.

FT-203-A: FOOD MICROBIOLOGY AND SAFETY

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

COMPULSORY FOUNDATION- THEORY

UNIT-I: Introduction to Food Microbiology

- Classification and growth of microorganism, factors affecting microbial growth.
- General characteristics, structure, classification, morphological characteristics, cultural characteristics of bacteria, fungi, virus, protozoa, and algae.
- Role of Harmful and beneficial microorganisms in food.

UNIT-II: Food Contamination and Spoilage

- General principles underlying spoilage: causes of spoilage, classification of foods based on 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 Infection and Intoxication Sources of infection of food by pathogenic organisms and physiological action, Signs and symptoms of various Bacterial Food-borne poisoning and Non-bacterial food-borne poisoning.
- Food safety: concept, factors affecting food safety, biological hazards.
- Applications of Food Microbiology- probiotics, prebiotics, microbial enzymes, fermentation process.

REFERENCES

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

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	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

SRI VENKATESWARA UNIVERSITY: TIRUPATI
Model Question paper
M.Sc (Home Science) Degree Examination
Second Semester
(CBCS for the students admitted from 2021-22 onwards)
Paper-III: FT- 203-A: FOOD MICROBIOLOGY AND SAFETY
(Common to MS Food Technology and M.Sc. Food Science Nutrition & Dietetics Course)

Time: 3 hours

Max Marks:80

SECTION- A

Answer any FOUR of the Following

Each question carries 5 marks

Marks: 4x5=20

1. Role of Micro organism in food industry.
2. Write the general Characteristics of bacteria?
3. Describe the different types of food spoilage?
4. How cereals and cereal products are contaminated?
5. Write the contamination sources of milk?
6. Describe the common spoilages in fish?
7. Write a short note on food borne infections?
8. How microbiology and food safety is related?

SECTION- B

Answer ALL questions

Each Question carries 15 Marks

4x15 =60 Marks

9. (a) Explain the factors affecting microbial growth?

(or)

- (b) Discuss about classification, morphological and cultural characteristics of viruses?
10. (a) Write the principles underlying food spoilage and discuss the common spoilages in fruits and vegetables.
- (or)
- (b). Describe the common food spoilages and common microbial spoilages in cereals and cereal products.
11. (a). Discuss the sources of contamination and spoilages in flesh foods.
- (or)
- (b). Enumerates the spoilages and sources of contamination in sugars and processed foods?
12. (a) Discuss in detail about various food borne intoxications with examples?
- (or)
- (b) Write in detail about applications of food microbiology.

FT203-B: NUTRITION IN EMERGENCIES AND DISASTER MANAGEMENT
(Common to M.Sc Food Science Nutrition & Dietetics and MS Food Technology Course)

Course Objectives - To enable the students to:

1. Understand the emergency situations in natural and manmade disasters.
2. Gain knowledge on nutrition surveillance and treatment in emergencies.
3. Knowledge on planning nutrition relief and rehabilitation in emergencies.
4. Explain concepts on Epidemiology and its application in planning programs during emergencies.

GENERIC ELECTIVE- THEORY

UNIT-I: Disasters

- Natural/Manmade disasters resulting in emergency situations: Famine, drought, flood, earthquake, cyclone, war, civil and political emergencies, Factors giving rise to emergency situation in these disasters.
- Nutritional problems in emergencies in vulnerable groups: Causes of malnutrition in emergency situations, Major deficiency diseases in emergencies, Protein – Energy Malnutrition / Starvation / Under Nutrition, Specific Nutrient deficiencies - Energy, Vitamins, Minerals
- Communicable disease: Surveillance and treatment. Control of communicable diseases in emergencies – Role of immunization and sanitation.

UNIT-II: Assessment

- Assessment and surveillance of Nutritional status in emergency affected populations: Scope of assessment of malnutrition in emergencies, Indicators of malnutrition. Clinical signs for screening acute malnutrition, Anthropometric assessment of nutritional status.

- Indicators and cut-offs indicating seriously abnormal nutrition situation: Weight for height based indices, MUAC, social indicators.
- Organization of nutritional surveillance and individual screening.

UNIT-III: Nutritional Relief and Rehabilitation

- Assessment of food needs in emergency situations, Food distribution strategy – Identifying and reaching the vulnerable group – Targeting Food Aid.
- Mass and Supplementary Feeding, Therapeutic Feeding, Special foods/rations for nutritional relief, Local production of special foods, Local foods in rehabilitation
- Organisation of mass feeding/general food distribution, Feeding centers, Transportation and food storage, Sanitation and hygiene, Evaluation of feeding programmes, Household food security and nutrition in emergencies
- Public nutrition approach to tackle nutritional problems in emergencies

UNIT-IV: Nutritional Epidemiology

- Introduction to Epidemiology – types of epidemiology, collection of epidemiological data, secondary routine data, Descriptive epidemiology, Cross sectional Analysis, prevalence and incidence, risk factors, risks and odds, relative and attributable risks
- Principles of Nutritional Epidemiology, Measurement issues, Measurement of disease, Occurrence and Measurement of association, Exposure and outcome, Socio demographic and Psycho social variables.
- Design and Planning of Nutritional Epidemiological studies – assessing and supplying and Evaluating Epidemiological studies – Discussion of selected case studies

REFERENCE

1. World Disasters Report – Focus on Public Health, International Federation of Red Cross and Red Crescent Societies.
2. Disasters – International Public Nutrition and Emergencies: The Potential for improving practice. Special Issue – Vol.23/4, Dec. 1999.
3. Guidelines and Research publications of OXFAM, WFP, Rome. 1999. Nutrient Requirements and Recommended Dietary Allowance for Indians A Report of the Expert Group of ICMR. 2010.
4. Dr.M Swami Nathan. (2010). Food and Nutrition Volume-2 Second Edition the Bangalore Printing and Publishing Co Ltd Bangalore 560018.
5. Shubhangini A. 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 in nutritional problems in natural and man made disasters.

CO2 Assess the nutritional status in emergency and plan surveillance and treatment to the affected.

CO3 Acquire knowledge on nutrition epidemiology.

CO4 Plan and Execute nutrition rehabilitation in emergencies.

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	2		2					3	3		3	3	
CO3	3		2	2			2	2				3		3
CO4			3			2			3			3		

High-3, Medium-2, Low-1

SRI VENKATESWARA UNIVERSITY::TIRUPATI

Model Question paper

M.Sc., (Home Science) Degree Examination

Fourth Semester

(Specialization 'A': Food Science Nutrition and Dietetics)

(CBCS for the students admitted from 2021-22 onwards)

FT- 203-B: NUTRITION IN EMERGENCIES AND DISASTER MANAGEMENT

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

Time : 3 hours

Max Marks:80

SECTION- A

Answer any FOUR of the Following

Each question carries 5 marks

Marks: 4x5=20

1. Famine.
2. Immunization.
3. MUAC.
4. Nutritional surveillance.
5. Targeting Food Aid.
6. Special foods/rations for nutritional relief.
7. Epidemiological data.
8. Psycho socio variables.

SECTION- B

Answer ALL questions

Each Question carries 15 Marks

Marks: 4x15 =60

9.(a). Discuss the causes of malnutrition in emergency situations and major deficiency diseases in emergencies.

(or)

(b). What are the communicable diseases that occur during emergencies? Discuss in detail about any one disease treatment and control.

10.(a). Discuss in detail about the nutritional assessment and surveillance in emergency affected populations.

(or)

(b). Write about methods of organizational surveillance and individual screening during emergencies.

11.(a). Write in detail about the assessment of food needs in emergency situations.

(or)

(b). Discuss in detail about the food storage and house hold food security in emergencies.

12.(a). What is Nutritional epidemiology? Discuss in detail about design and planning of nutritional epidemiological studies.

(or)

(b). Discuss in detail about types of epidemiology and collection of epidemiological data.

204-A: RESEARCH METHODOLOGY

(Common to all specializations of M Sc Home Science and MS Food Technology course)

Course Objectives - To enable the students to:

1. Get awareness about terms like 'variables', 'hypothesis', research 'and recognize the purpose of doing research.
2. Understand different types of research like experimental, survey, applied, action research etc., and differentiate advantages and disadvantages each type of research.
3. Critically apply knowledge to select a sample by using different sampling methods like probability and non-probability sampling.
4. Develop a research proposal in the appropriate scientific style.

ELECTIVE FOUNDATION -THEORY

UNIT – I: Research Purpose and Types

- Research – Significance, meaning, objectives, Approaches,
- Research process, Criteria of good research, Variable- types
- Types of Research: Historical, descriptive, experimental, case study, survey research, participatory research, Fundamental, applied and action, exploratory research.
- Research hypothesis-Characteristics of good hypothesis.
- Research Design – Meaning, Need, Concepts, Principles and Types of research design

UNIT – II: Research Problem and Sample design

- Definition and Identification, Necessity and Selection of Research problem, Technique involved in defining the research problem.

- Population and Sample – Implications, Steps, Criteria and Characteristics of a good design
- Sampling Methods : *Probability sampling*- Simple random, systematic random sampling, two Stages and multi stage sampling, cluster sampling and *Non-probability sampling* - Purposive, quota and volunteer sampling / Snowball Sampling.

UNIT –III : Methods of Data Collection

- Primary and Secondary Data, Selection of appropriate method for data collection
- Different Methods and techniques of data collection - Interview, Observation, Social mapping, Participatory assessment Techniques, Observation check list, Questionnaire, Interview schedule, Group discussions, Case studies

UNIT –IV: Measurement Scales

- Measurement in Research, Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling, Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques
- Research Proposal – Preparation.

References

1. Kothari, C.R. (2004).: “*Research Methodology (Methods and Techniques)*”. New Age International (p) Ltd., New Delhi.
2. Bandarkar, P.L. and Wilkinson T.S. (2000) : “*Methodology and Techniques of Social Research*”, Himalaya Publishing House, Mumbai.
3. Batnagar, G.L. (1990) : “*Research Methods and Measurements in Behavioural and Social Sciences*”, Agri. Cole publishing Academy, New Delhi.
4. Bajpai S.M. (1987). “*Methods of Social Survey and Research*” KitabGhat, Kanpur-3
5. Black, T.R. (1999).: “*Doing Quantitative Research in the Social Sciences*”, Sage Publications, New Delhi.
6. Dev Doss R.P. and Kulandavel K (1985). “*Hand book of methodology of research*” Oxford Press,
7. Goode J.W. and Hatt P.K. “*Methods in Social Science Research*” Mc. Graw hill-Co. New York.
8. Sharma S.R. (1994). “*Statistical methods in Educational Research*”, Anmol Publications Pvt. Ltd., New Delhi.

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

- CO1.** Define terms like ‘variables’, ‘hypothesis’, ‘research’ and state the purpose of doing research
- CO2.** Understand different types of search and can compare the advantages and disadvantages of each type of research
- CO3.** Critically know the procedures for identifying an ideal sample for scientific research.
- CO4.** Prepare a research proposal in the appropriate scientific style .

CO-PO Mapping

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

High-1, Medium-2, Low-3

SRI VENKATESWARA UNIVERSITY::TIRUPATI

Model Question paper

M.Sc., (Home Science) Degree Examination

Second Semester

(Specialization 'A': Food Science Nutrition and Dietetics)

(CBCS for the students admitted from 2021-22 onwards)

Paper-IV: 204-A-RESEARCH METHODOLOGY

(Common to all specializations of M Sc Home Science and MS Food Technology course)

Time:3 hrs

Max: 80 Marks

SECTION- A

Answer any four questions

Each question carry equal marks Marks:4X5=20

1. Define research. Enumerate the significance of research.
2. Explain the need and features of a good research design.
3. Write about Quota and snow ball sampling.
4. Describe case study as a research technique.
5. What is meant by primary and secondary data?
6. Give an account of Nominal scale.
7. What is Social mapping?
8. Write about Observation check list.

SECTION- B

Answer all questions

Each question carry equal marks Marks: 4 X 15=60

9. (a). Write in detail about types of research.

(Or)

(b). Write about the types of research design.

10. (a). Explain in detail about the definition, identification and selection of research problem.

(Or)

(b). Define qualitative research and explain the types of qualitative research.

11. (a). What is data? Explain in detail different methods of data collection.

(Or)

(b). Describe in detail about the Observation and Interview methods of data collection.

12. (a). What are measurement scales? Explain its significance in statistical analysis?

(Or)

(b). Explain in detail about the steps in preparing a research proposal.

204-B: STATISTICS AND COMPUTER APPLICATIONS

(Common to all specializations of M Sc Home Science and MS Food Technology course)

Course Objectives - To enable the students to:

1. Get awareness about the scope of statistics in research.
2. Understand the concepts of inferential statistics like t-test, chi-square, Correlation and Variance.
3. Critically apply knowledge of application of statistics in data analysis.
4. Know about the application of computers in research process.

ELECTIVE FOUNDATION -THEORY

UNIT- I: Statistics

- Statistics: Meaning, Definition and Scope, limitations – Role of statistics in Research
- Descriptive Statistics: Classification and tabulation of data, Graphic and diagrammatic presentation of data, measurement of central tendency, variation and dispersion, Normal distribution, Frequency distribution, histogram, frequency polygons, curve ogive
- Levels of Significance

UNIT – II: Inferential statistics

- 't' test for large samples (mean and proportions) and small samples
- Chi square test for significance and association
- Analysis of variance-one way, two way
- Correlation, coefficient of correlation, rank correlation

UNIT – III: Computer Applications I

- Introduction to Computer-Block diagram, PC and its components, Memory capacity, Physical storage of data, various devices, Hardware and software operating- DOS commands for file handling.
- MS Office and its component – Word and its applications/ creating documents, editing spell check, auto correct and print preview, creating tables and sorting data in tables, mail merge and its usage.

UNIT – IV: Computer Applications II

- MS Excel for data analysis - Work sheet and its structure, data entry, editing, Sorting filtering and copying.
- Statistical functions in Excel – Data analysis park for performing descriptive statistics, t-test, ANOVA, Correlation and regression.
- Graphs in Excel – Various types of graphs, editing graphs

References

1. Kothari, C.R. (2004).: “*Research Methodology (Methods and Techniques)*”. New Age International (p) Ltd., New Delhi.
2. Bandarkar, P.L. and Wilkinson T.S. (2000) : “*Methodology and Techniques of Social Research*”, Himalaya Publishing House, Mumbai.
3. Batnagar, G.L. (1990) : “*Research Methods and Measurements in Behavioural and Social Sciences*”, Agri. Cole publishing Academy, New Delhi.
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8. Sharma S.R. (1994). “*Statistical methods in Educational Research*”, Anmol Publications Pvt. Ltd., New Delhi.

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

- CO1.** Define terms like ‘frequency distribution’, ‘Variance’ , ‘Correlation’ and its scope in research data
- CO2.** Understand different types of statistics that are used in research data.
- CO3.** Critically know the calculations of different statistics of research data.
- CO4.** Know the use of computer applications in research process.

CO-PO Mapping

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

High-1, Medium-2, Low-3

SRI VENKATESWARA UNIVERSITY::TIRUPATI
Model Question paper
M.Sc., (Home Science) Degree Examination
Second Semester
(Specialization 'A': Food Science Nutrition and Dietetics)
(CBCS for the students admitted from 2021-22 onwards)
Paper-IV: 204-B – Statistics and Computer Applications
(Common to all specializations of M Sc Home Science and MS Food Technology course)

Time:3 hrs

Max: 80 Marks

SECTION- A

Answer any four questions

Each question carry equal marks Marks:4X5=20

1. Frequency distribution.
2. Histogram.
3. Rank correlation.
4. Mean.
5. File handling.
6. Computer software.
7. What is data analysis?
8. Descriptive statistics.

SECTION- B

Answer all questions

Each question carry equal marks Marks: 4 X 15=60

9. (a). What is a *t*-test? When it is used and for what purpose(s)? Explain by means of examples.
(Or)
- (b). In a test given to two groups of students, the marks obtained were as follows:*First Group*
18 20 36 50 49 36 34 49 41 *Second Group* 29 28 26 35 30 44 46
Examine the significance of difference between mean marks obtained by students of the above two groups. Test at five per cent level of significance.
10. (a). 200 digits were chosen at random from a set of tables. The frequencies of the digits were:
Digit 0 1 2 3 4 5 6 7 8 Frequency 18 19 23 21 16 25 22 20 21 15 Calculate χ^2 . (Or)
- (b). What is Chi-square test? Explain its significance in statistical analysis.
- 11.(a). What is data? Explain in detail the data processing and analysis in computers.
(Or)
- (b). Describe in detail about the PC and its components.
- 12.(a). What is an excel sheet? Explain its significance in statistical analysis?
(Or)
- (b). Explain in detail about the steps in preparing different graphs in computers.

PRACTICAL-1: FT-205: FRUIT AND VEGETABLE TECHNOLOGY & DAIRY TECHNOLOGY/ FOOD MICROBIOLOGY AND SAFETY

FT-201: FRUIT AND VEGETABLE TECHNOLOGY

Course Objectives:

- To enable the students on various fruit and vegetable processing techniques.
- To attain practical knowledge in production and preparation of products.

PRACTICALS:

1. Physical tests
 - Check for Firmness of fruits and vegetables by Penetrometer.
 - Estimation of Pigments- Chlorophyll.
2. Chemical tests
 - Estimation of total soluble solids (TSS).
 - Estimation of pH and acidity of products.
3. Ripening of fruits and vegetables by using chemicals- Ethylene.
4. Biochemical changes in fruits and vegetables-estimation of catalase, peroxidase enzymes.
5. Preparation and evaluation of pectin products
6. Vegetable and fruit Maturity Indexes at post harvesting stage
7. Fruit Juice/Pulp Extraction, Concentration and Evaluation & RTS preparation.
8. Tomato Ketchup, Sauce, Culinary Paste
9. Visits to ripening and packaging houses.
10. Visits to fruit and vegetable processing industries

Course Outcomes:

CO1 Learn the processing and preservation methods to prevent the spoilage of Fruit & vegetables.

CO2 Develop various Fruits & vegetables based products and preserves

FT-203-A: FOOD MICROBIOLOGY AND SAFETY

Course Objectives

- Acquire knowledge on laboratory techniques to identify microorganisms in food.
- Creating awareness on role and significance of microbial inactivation, adaptation and environmental factors (i.e., aW, pH, temperature) on growth and response of microorganisms in various environments.

PRACTICALS:

1. Laboratory safety rules and precautions
2. Familiarization with Instruments used in Microbiological Lab, their principles and working.
3. Sterilization methods
4. Sampling techniques
5. Isolation techniques
6. Various types of media preparation and Methods of sterilization of media
7. Microbial Staining Techniques
8. Microbial examination of fresh food products: Identification, isolation and confirmation
9. Microbial examination of processed foods: Identification, isolation and confirmation.
10. Detection of E.coli from food sample

Course Out comes

CO1 Apply techniques to identify different microorganisms in foods.

CO2 Compare the role and significance of microbial inactivation, adaptation and environmental factors (i.e., aw, pH, temperature) on growth and response of microorganisms in various environments.

FT-203-B: NUTRITION IN EMERGENCIES AND DISASTER MANAGEMENT

Course Objectives -

1. To gain knowledge on nutrition surveillance and treatment in emergencies.
2. To know the concepts on Epidemiology and its application in planning programs during emergencies.

PRACTICALS:

1. Collection of epidemiological data-a hands on experience.

2. Selection and Rapid assessment of nutritional status in a community.
3. Case study approach on causative factors and management of communicable diseases.
4. Planning and formulation of nutrient dense foods.
5. Survey on adherence to immunization schedule and vaccines.

Course Out comes -

CO1 Acquire knowledge in nutritional problems in natural and man made disasters.

CO2 Assess the nutritional status in emergency and plan and Execute nutrition rehabilitation in emergencies.

**PRACTICAL-1: FT-206 : DAIRY TECHNOLOGY & 204-A: RESEARCH
METHODOLOGY/204-B: STATISTICS AND COMPUTER APPLICATIONS**

FT-202:DAIRY TECHNOLOGY

Course Objectives:

- To acquire knowledge of milk grading and processing of milk and milk products.
- To demonstrate the manufacturing of various dairy products and exemplify the quality of dairy products.

PRACTICALS:

1. Physical test - Organoleptic evaluation of milk.
2. Analysis of milk composition – Fat and SNF.
3. Chemical tests- temperature, pH, acidity, COB, Phosphatase test.
4. Microbiological test – MBRT.
5. Preparation of ghee from cream and butter.
6. Preparation of Khoa from cow, buffalo and concentrated milk.
7. Preparation of Paneer from cow, buffalo and mixed milk.
8. Preparation of fermented milk products.
9. Product development with bi-products of milk.
10. Visit to Dairy plant.

Course Outcomes -

CO1 Gain knowledge of milk composition, types and grades of milk.

CO2 Apprehend the manufacturing and quality analysis of different dairy products.

FT-204-A: RESEARCH METHODOLOGY

Course Objectives -

1. To understand different types of research like experimental, survey, applied, action research etc., and differentiate advantages and disadvantages each type of research.
2. To acquire knowledge in developing a research proposal in the appropriate scientific style.

PRACTICALS

1. Identification of different variables in specialization of study.
2. Framing of hypothesis-Null and alternate Hypothesis
3. Preparation of schedule/questionnaire.
4. Preparation of research proposal
5. Study of an article in a journal-Abstract, Methodology, Results and Bibliography

Course Outcomes -

CO1. Understand different types of search and can compare the advantages and disadvantages of each type of research

CO2. Critically know the procedures for identifying an ideal sample for scientific research and able to prepare a research proposal in the appropriate scientific style .

FT- 204-B: STATISTICS AND COMPUTER APPLICATIONS

Course Objectives -

1. To understand the concepts of inferential statistics like t-test, chi-square, Correlation and Variance.
2. To gain knowledge of application of statistics in data analysis.

PRACTICALS

1. Graphic and diagrammatic presentation of data.
2. Calculation of Averages- Arithmetic mean, mode and median.
3. Calculation of Standard deviation and 't' test for large and small samples.
4. Calculation of Correlations.
5. Calculation of chi square to find out significance of association.

Course Outcomes -

CO1. Define terms like 'frequency distribution', 'Variance' , 'Correlation' and its scope in research data

CO2. Critically know the calculations of different statistics of research data.

FT-207: HUMAN VALUES AND PROFESSIONAL ETHICS - II
(Revised Syllabus with effect from 2021-22 onwards)
AUDIT COURSE

Course Objectives: This course helps the students to;

1. Associate the terms 'value education' 'self-introspection' and 'self-esteem' which are the core aspirations of all human beings.
2. Understand the importance of ethics in different fields like medical, business, environment and social ethics and ethics of media.
3. Apply the knowledge to assess issues and problems in each profession and correlate the concepts in addressing the ethical issues while choosing and joining a profession.
4. Develop all round and well balanced personality of the students and shapes them to become morally finer, socially responsible and physically fit persons of the society.

AUDIT COURSE-THEORY

UNIT-I:

- Value Education- Definition - relevance to present day - Concept of Human Values - self introspection – Self-esteem - Family values-Components, structure and responsibilities of family.
- Neutralization of anger - Adjustability - Threats of family life - Status of women in family and society - Caring for needy and elderly - Time allotment for sharing ideas and concerns.

UNIT-II:

- Medical ethics- Views of Charaka, Sushruta and Hippocrates on moral responsibility of medical practitioners. Code of ethics for medical and health care professionals.

Euthanasia, Ethical obligation to animals, Ethical issues in relation to health care professionals and patients.

- Social justice in health care, human cloning, problems of abortion. Ethical issues in genetic engineering and Ethical issues raised by new biological technology or knowledge.

UNIT-III:

- Business ethics- Ethical standards of business-Immoral and illegal practices and their solutions.
- Characteristics of ethical problems in management, ethical theories, causes of unethical behavior, ethical abuses and work ethics.

UNIT-IV:

- Environmental ethics- Ethical theory, man and nature- Ecological crisis, Pest control, Pollution and waste.
- Climate change, Energy and population, Justice and environmental health.

UNIT-V:

- Social ethics- Organ trade, Human trafficking, Human rights violation and social disparities, Feminist ethics. Surrogacy/pregnancy.
- Ethics of media- Impact of Newspapers, Television, Movies and Internet.

REFERENCES

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5. SusrptaSamhita: Tr.KavirajKunjanlal, KunjalalBrishagratha. Chowkarnba Sanskrit series. VolLII and III, Varnasi, Vol I 00,16'20,21-32 and 74-77 only.
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9. An Introduction to Applied Ethics (Ed.) John H.Piet and Ayodhya Prasad. Cosmo Publications
10. Text Book for Intermediate First Year Ethics and Human Values. Board of Intermediate Education- Telugu ~ Akademi, Hyderabad.

Course Outcomes -After studying the course, students will able ;

CO1 Associate the terms 'value education' 'self-introspection' and 'self-esteem' which are the core aspirations of all human beings.

CO2 Understand the importance of ethics in different fields like medical, business , environment and social ethics and ethics of media.

CO3 Apply the knowledge to assess issues and problems in each profession like medical, business , environment and social ethics and ethics of media and correlate the concepts in addressing the ethical issues while choosing and joining a profession.

CO4Apply skills for anger management, care of elderly, environmental protection and thereby develop well balanced personality and will contribute to society as morally finer, socially responsible and physically fit persons.

CO-PO Mapping

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

High-3, Medium-2, Low-1

SRI VENKATESWARA UNIVERSITY:: TIRUPATI**MODEL QUESTION PAPER****M.Sc. (Home Science) Degree Examination****Second Semester**

(Specialization – MS Food Technology)

(CBCS for the students admitted from 2021-22 onwards)

FT- 207: HUMAN VALUES AND PROFESSIONAL ETHICS - II**Time: 3 Hrs****Max: 100 Marks****Part – A****Answer any four questions****Each question carry equal marks****(4X5=20 Marks)**

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

Part – B**Answer all questions**

Each question carry equal marks

(4X15 = 60 Marks)

9. a)

(Or)

b)

10. a)

(Or)

b)

11. a)

(Or)

b)

12. a)

(Or)

b)

III SEMESTER

**DEPARTEMNT OF HOME SCIENCE
M S FOOD TECHNOLOGY
CHOICE BASED CREDIT SYSTEM (CBCS)
(With effect from academic year 2021-22 onwards)**

SEMESTER III

**FT- 301: FOOD PROCESSING AND PRESERVATION TECHNOLOGY
(Common to MS Food Technology and M.Sc. Food Science Nutrition & Dietetics 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.

CORE-THEORY

UNIT-I: Food Processing and Preservation – An Introduction

- Need, Purpose, Principles and Methods of food processing and preservation. Definitions
- Traditional Methods of food processing and preservation.
- Preservatives and Additives –Definitions, Classification, applications, permissible limits and safety aspects.

UNIT-II: Methods of Food Processing and Preservation

- Processing and preservation by Heat - Principles of thermal processing, blanching, pasteurization, UHT processing, thermal sterilization, canning, extrusion.
- Processing and preservation by Cold- Refrigeration and freezing, methods of freezing, effect on quality of foods.
- Processing and preservation by Drying and Dehydration -Types, Methods and their suitability for different food products.
- Processing and preservation by Concentration – Types, Methods and their suitability for different food products.

UNIT-III: Processing and Preservation by Fermentation

- Definition, types, Importance, Technology, Benefits and Limitations.
- Processing and preservation of fermented foods – Cereal and pulse products, Fruits and Vegetables, Milk products, meat products and Beverages.

UNIT-IV: Advanced Food Processing Technologies

- Irradiation, High Pressure Processing, Pulse Electric Field, Microwave, Ohmic Heating, Reverse Osmosis, Ultra Filtration and Membrane Processing.
- Minimal Processing, Edible Coatings and Films, Encapsulation, Nano technology Hurdle Technology, Artificial Intelligence (AI) Technologies and Advanced Robotics in Food Industry.

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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.
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7. 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

SRI VENKATESWARA UNIVERSITY::TIRUPATI

Model Question paper

M.Sc(Home Science) Degree Examination

Third Semester

(Specialization: MS Food Technology)

(CBCS for the students admitted from 2021-22 onwards)

Paper-I: FT- 301: FOOD PROCESSING AND PRESERVATION TECHNOLOGY

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

Time : 3 hours

Max Marks:80

SECTION- A

Answer any FOUR of the Following

Each question carries 5 marks

Marks: 4x5=20

1. Define food additive and write its classification?
2. Write about the principles of food preservation?
3. Explain the Process of blanching and its types?
4. Write a note on canning process?
5. Explain the fermentation technology and its advantages?
6. Write the fermentation process for cereals and pulse products.
7. Explain the applications of advanced robotics in food processing?
8. Write the advantages and disadvantages of Irradiation process?

S ECTION- B

Answer ALL questions

Each Question carries 15 Marks

4x15 =60 Marks

9. (a) Enumerate the different methods of food processing and preservation ?

(or)

(b). Explain the applications, permissible limits and safety aspects of food additives?

10.(a). Write the principles of thermal processing and Explain the Pasteurization, UHT processing?

(or)

(b). Discuss the types and methods of food preservation by concentration?

11.(a). Write the role of fermentation in bread making.

(or)

(b). Explain in detail about the process of fermentation of milk and meat products?

12.(a). Explain the following: (A) High Pressure processing (B) Artificial Intelligence

(or)

(b). Give a detailed note on Edible Coatings, Films and its applications in food?

FT-302: LIVE STOCK AND SEA FOOD TECHNOLOGY

Course Objectives- To enable the students to:

1. Understand the grades, structure, composition and nutritional quality of various livestock and seafood
2. Comprehend the slaughtering, carcass processing, post-mortem changes.
3. Illustrate the processing technology of meat, poultry, fish and eggs.
4. Develop skills in value addition of meat, fish and poultry products.

CORE-THEORY

UNIT-I: Meat and Meat Products Technology:

- Present Status of Meat Industry in India and Abroad.
- Judging & grading of live meat animals (Buffalo, Sheep, Goat, Pigs).
- Stunning, slaughtering and dressing operations of food animals - Cattle, Buffalo, Sheep, Goat, Pigs, Rabbits and Poultry.
- Structure, Chemical composition and nutritive value of muscle of food animals including poultry – Proportion of muscular tissues in different meat animals- Associative connective tissues- Muscle fiber.

UNIT-II: Meat Processing and preservation

- Conversion of muscle into meat- Post mortem changes in meat -Rigor mortis- Protein denaturation- Proteolysis-Physico-chemical properties of meat - Factors influencing meat quality- PSE and DFD meat- Pre rigor processing.
- Principles of Meat Preservation – Moisture Control – Temperature Control- Direct microbial inhibition.

- Modern processing techniques for Meat Processing- Concept of meat emulsification- Comminution- Restructuring- Retort pouch Processing-Value Added and Processed Meat Products

UNIT-III: Egg and Poultry Products Technology:

- Preservation and maintenance of egg – Egg cleansing – Oil treatment – Cold storage- Thermo stabilization- Immersion in liquids – Value Added Egg Products.
- Candling and Grading of eggs.
- Pre slaughter handling, transportation and primary and secondary processing of poultry.
- Evaluation and grading of dressed carcasses of various food animals including poultry.
- Processing and preservation of poultry meat products.

UNIT-IV: Sea Food Technology

- Present status of Fish, Shrimp and Prawns processing in India.
- Classification of Fish, Commonly cultivated fish, shrimp and prawns.
- Selection, Grading and Procurement of fish, Shrimp and Prawns– Shipboard operations.
- Factors affecting the quality of fish, Shrimp and Prawns.
- Processing and preservation of fish and Other products
- Value Added Sea Food Products.

REFERENCES

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4. Parkhurst&Mountney.(1997). *Poultry Meat and Egg Production*, CBS Publication, New Delhi.
5. Pearson &Gillet. (1997). *Processed Meats*,3 Ed, CBS Publication, New Delhi.
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7. Shahidi,F. and Botta,J.R. (1994).*Seafoods: Chemistry, Processing, Technology and Quality*, Blackie Academic &Professional,London.
8. ShaiBarbut. (2005). *Poultry Products Processing*, CRC Press.
9. Stadelman,W.J. and Owen, J.C.(2002).*Egg Science and Technology*, 4th Ed. CBS Publication New Delhi.

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

CO1Acquire knowledge of the structure, composition, nutritional quality of various, livestock and seafood.

CO2Understand the slaughtering, carcass processing methods used for processingmeat.

CO3Gain an insight of the concept and methods of processing technology of meat, poultry and fish.

CO4Prepare various value-added products of egg, meat, poultry and sea foods.

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		3	3
CO3	3				3				2		1	3	3	3
CO4	3				3			2			2	3	3	3

High-3, Medium-2, Low-1

SRI VENKATESWARA UNIVERSITY: TIRUPATI
Model Question paper
M.Sc (Home Science) Degree Examination
Third Semester
(Specialization: MS Food Technology)
(CBCS for the students admitted from 2021-22 onwards)
Paper-II:FT-302: LIVESTOCK AND SEA FOOD TECHNOLOGY

Time : 3 hours

Max Marks:80

SECTION- A

Answer any FOUR of the Following
Each question carries 5 marks

Marks: 4x5=20

1. Write short notes on present status of meat and fish industry in India?
2. Various stunning methods during slaughtering?
3. What is rigor mortis?
4. Explain the protein denaturation of meat?
5. Write the composition of egg?
6. Write about the process of thermo stabilization in egg preservation?
7. Write the selection criteria of fish for processing?
8. Explain factors affecting the quality of fish and prawns?

SECTION- B

Answer ALL questions
Each Question carries 15 Marks

4x15=60 Marks

9. (a). Explain the structure and chemical composition of meat?
(Or)
(b). Explain the evaluation and grading of dressed carcass of meat animals?
10. (a). Explain the factors influencing meat quality and write the principles of meat preservation?
(Or)
(b). Enumerate the modern processing techniques of meat?
11. (a). Describe the storage, processing and preservation of eggs.
(Or)
(b). Write the processing and preservation of poultry meat products.
12. (a). Explain the shipboard operations involved in processing of fish and sea foods.
(Or)
(b). Write in detail about processing and preservation of fish and sea food products.

FT-303-A: TECHNOLOGY OF SPICES, CONDIMENTS AND PLANTATION CROPS

Course Objectives - To enable the students to:

1. Identify various spices, condiments and plantation crops.
2. Learn post-harvest technologies and processing of spices, condiments and plantation crops.
3. Illustrate various value added products of spices, condiments and plantation crops.
4. Perceive Standards, specifications, packaging and Quality control measures of spices, condiments and plantation crops.

GENERIC ELECTIVE -THEORY

UNIT-I: Introduction

- Commercial value of Spices, Condiments, plantation crops and their products in global market.
- History, definition, classification and composition of spices, condiments and Plantain crops.
- [Classification of Spices and condiments](#)-based on parts used, aromatic origin, family and mixed: major and minor spices
- Post-Harvest Technology of spices, condiments and Plantain crops.
- Quality control measures of spices, condiments and plantation crops.

UNIT-II: Spices and condiments

- Production technologies and processing of Major - Pepper, Cardamom, Ginger, Red and Green Chilli, Turmeric and Minor Spices- Cumin, Coriander, Cinnamon, Fenugreek, Garlic, Nutmeg, Clove, Mint, Vanilla.
- Sources, Processing of Flavoring agents and extracts, Flavoring components and concentrates.
- Value added products of spices and condiments.

UNIT-III: Plantation crops-A

- Coffee: Bean processing – Grading, blending, roasting of seeds, grinding, brewing; Coffee varieties & processing - Decaffeinated Coffee, Instant Coffee, extraction, Dehydration, Aromatization; Plant and machinery for coffee processing.
- Tea: Tea processing- leaves gathering, Grading, leaf processing; Types of tea & processing - dust tea, black tea, green tea, Oolong tea, Instant tea; Plant layout and machinery for tea processing.

UNIT-IV: Plantation crops - B

- Cocoa – Production, Composition, Grading, Processing, Cocoa Products (cocoa mass, cocoa powder, cocoa butter, cocoa-based beverages, malted beverages, cocoa liquor)
- Coconut – Production, Composition, Grading, Post-Harvest Technology, Processing and Products (coconut milk, desiccated coconut).
- Cashew nut Harvesting and Processing

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6. Vijayakhader. (2001). "Text Book of Food science and Technology" ICAR, New Delhi.
7. NIIR board of consultants and engineers. The complete book on spices and condiments, Asia pacific business press, New Delhi.

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

CO1 Gain an in-depth knowledge on spices, condiments and plantation crops.

CO2 Apply post-harvest and processing technologies to improve the quality and safety of spices, condiments and plantation crops.

CO3 Recommend Standards, specifications, packaging and Quality control measures of spices, condiments and plantation crops.

CO4 Able to prepare various value added products of spices, condiments and plantation crops.

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							3	3	3
CO3	3							3	3		2	3	3	3
CO4	3		3						3	3		3	3	3

High-3, Medium-2, Low-1

SRI VENKATESWARA UNIVERSITY: TIRUPATI
Model Question paper
M.Sc (Home Science) Degree Examination
Third Semester
(Specialization: MS Food Technology)
(CBCS for the students admitted from 2021-22 onwards)

Paper-III: FT-303-A: TECHNOLOGY OF SPICES, CONDIMENTS AND PLANTATION CROPS

Time : 3 hours

Max Marks:80

SECTION- A

Answer any FOUR of the Following

Each question carries 5 marks

Marks: 4x5=20

1. Write the classification of spices? Give examples.
2. Write short notes on global market of spices and condiments?
3. A brief note on processing of flavoring components?
4. Value added products of spices and condiments?
5. Give the classification of plantation crops with suitable examples?
6. Write about Aromatization, Dehydration in coffee Processing?
7. Write the composition of Cocoa?
8. Explain the processing of coconut?

SECTION- B

Answer ALL questions

Each Question 15 Mark

4x15=60 Marks

9. (a). Give a detailed classification of Spices and condiments based on parts used, aromatic origin and family.
(or)
(b). Explain the post harvest technologies and quality parameters of spices and condiments?
10. (a). Describe the production and processing techniques of major spices ?
(or)
(b). Explain the extraction methods of flavoring agents?
11. (a). Write in detail about coffee bean Processing?
(or)
(b). Describe the different types of tea and its processing?
12. (a). Explain the post harvest technology of cocoa bean processing and its products.
(or)
(b). Enumerate the cashew nut harvesting and processing?

FT-303-B: BASIC FOOD ENGINEERING

Course Objective To enable the students to:

1. Understand the basic Principles of food engineering.
2. Describe the types and properties of Refrigeration systems
3. An insight of agro processing equipments like pasteurizer, spray drier and sealing equipments.
4. Enumerate processing equipments and maintenance of processing equipments

GENERIC ELECTIVE- THEORY

UNIT-I: Basic Principles of Food Engineering

- Engineering properties of food materials: physical, thermal, aerodynamic, mechanical, optical and electromagnetic properties.
- Units, Dimensions and Conversions: Unit Operations, design of food process equipments, elements of measuring instruments- machine elements and electrical elements.

UNIT-II: Basics of Vapor Compression Cycle:

- Properties of steam and Moist air- Boilers operation, Pressure vessels.
- Evaporators-Types of Evaporators Boiler house and workshop.

UNIT-III: Refrigeration and Freezing in Food Industry

- Parts and Functions of a Refrigerator. Refrigeration Cycle. Types of Refrigerants. Concept of Refrigerator Load (one ton, etc.).
- Cryogenic Freezing and Individual Quick Freezing (IQF)

UNIT-IV: Plant Designs

- Plant designs process designs development and general design considerations. Process economics: Economic feasibility of projects using order of magnitude cost estimates plant and equipment cost estimations, product cost estimations; batch vs continuous operations.
- Factors to be considered for location and layout of food plants. Regulatory requirements of food industries.

REFERENCES

1. Berk, Z. (2018). Food process engineering and technology. Academic press.
2. Das, H. 2005. Food Processing Operations Analysis. Asian Books.
3. Rao, G.C. 2006. Essentials of Food Process Engineering. BS Publications.
4. Rao, M.A, S.S.H. Rizvi and A.K. Datta. 2005. Engineering Properties of Food, 3rdedn. Taylor and Francis

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

CO1 Ability to apply principles of food engineering in industry.

CO2 Able to operate Food processing equipments

CO3 Acquaint with refrigeration system and material handling.

CO4 Gain an insight of agro processing equipments and handling techniques.

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

High- 3, Medium- 2, Low- 1

SRI VENKATESWARA UNIVERSITY::TIRUPATI
Model Question paper
M.Sc (Home Science) Degree Examination
Third Semester
(Specialization: MS Food Technology)
(CBCS for the students admitted from 2021-22 onwards)
Paper-III:FT-303-B:BASIC FOOD ENGINEERING

Time: 3 hours

Max Marks: 80

SECTION- A

Answer any FOUR of the Following

Each question carries 5 marks:

Marks: 4x5=20

1. Enumerate the basic principles of food engineering?
2. Discuss in detail on unit dimension and conversions.
3. What are the properties of steam and moist air?
4. Describe about pressure vessels and evaporators?
5. What are the different types of refrigeration systems?
6. What do you mean by cryogenic freezing?
7. What are the Factors to be considered for designing a plant layout?

8. Explain about Regulatory requirements of food industries?

SECTION- B

Answer ALL questions

Each Question carries 15 Marks

4x15 =60 Marks

9. (a). Discuss in detail on unit dimension and conversions?

(or)

(b). Write a note on Engineering properties of food materials?

10.(a).Enumerate the working, operation and maintenance of graders and evaporators?

(or)

(b). Explain the properties and operation of vapor compression cycles?

11.(a).Write in detail about Refrigeration Cycle and types of Refrigerants?

(or)

(b).Explain about boiler house, workshop and its operation?

12.(a). What are the Factors to be considered for location and layout of food plants?

(or)

(b). Design a blue drawing and layout of a food processing industry?

**PRACTICALS: FT-304: FOOD PROCESSING AND PRESERVATION
TECHNOLOGY + LIVE STOCK AND SEA FOOD TECHNOLOGY**

FT- 301: FOOD PROCESSING AND PRESERVATION TECHNOLOGY

Course Objectives:

- To acquire knowledge of emerging technologies and their applications in food processing and preservation.
- To demonstrate various processing techniques and products of various foods.

PRACTICALS:

1. Market survey of processed and preserved foods and to study the methods of processing, preservation, Additives and preservatives used, shelf life, cost and form of availability.
2. Preservation of food by traditional methods using sugar, salt and turmeric powder etc.
3. Preservation by using Chemical preservatives.
4. Preparation of Jams, Jellies, fruit Juices, Squashes, Sauces and bottling – Shelf life study.
5. Pickling with a variety of foods - Shelf life study.
6. Drying and dehydration of foods.
7. Refrigeration, Freezing and freeze drying of foods.

8. Extrusion processing.
9. Processing and preservation of fermented products.
10. Visits to different commercial food processing units and Industries.

Course Outcomes:

CO1 Understand the applications and limitations of food processing and preservation technology.

CO2 Application of appropriate technologies to process and preserve the foods to extend their shelf life.

FT-302: LIVE STOCK AND SEA FOOD TECHNOLOGY

Course Objectives-

1. To understand the grades, structure, composition and nutritional quality of various livestock and seafood
2. To develop skills in processing and preparation of value addition products of meat, fish and poultry.

PRACTICALS:

1. Tests for determination of physico- chemical quality of meat and meat products:
 - a. pH, Extract Release Volume (ERV)
 - b. Meat Swelling capacity, Total Volatile Basic Nitrogen (TVBN),
 - c. Picric acid turbidity, Dye reduction capacity.
2. Determination of Nitrate in meat
3. Test for presence of poly phosphates

4. Determination of total volatile bases in frozen fish

5. Determination of moisture in dried fish

6. Determination of sodium chloride in dried fish

7. Determination of Ash insoluble in dilute hydrochloric acid

Course Outcomes-

CO1 Acquire knowledge of the structure, composition, nutritional quality of various, livestock and seafood.

CO2 Process and Preparation of various value-added products of egg, meat, poultry and sea foods.

**FT - 305: FOOD INDUSTRY MANAGEMENT
(SKILL ORIENTED COURSE)**

Course Objectives - To enable the students to:

1. Provide hands on experience with regard to different areas in food industries.
2. Acquaint and gain knowledge related to production, unit operations, quality control and marketing aspects of food industry.
3. Gain knowledge associated with basic process requirements, documentation and maintenance of a food industry.
4. Emphasize the prominence of food plant sanitation, food safety, standards, laws and regulation in food industry.

SKILL ORIENTED COURSE -THEORY

UNIT-I: Food Industry –An overview

- Introduction, Status of Global food industry, Indian food industry.
- Components of Food Industry – Agriculture, Food processing, Food distribution, Regulation, Financial services, research and Development, marketing.

- Scope for Expansion, Future priorities in Food Production, challenges.
- Government initiatives - MOFPI, objectives and functions, schemes for Infrastructure development, technology up-gradation & modernization, human resources development and R&D.

UNIT-II: Food Industry Maintenance

- Maintenance - staff and plant operators; Preventive maintenance; Guidelines for good maintenance & safety precautions; Work place improvement through '5S'.
- Book keeping, Record maintenance, Audit Check List Preparation of HACCP based SOP checklists for Maintenance and sanitation.
- Wastewater and solid waste treatment: - Waste-types-solid and liquid waste characterization, physical, chemical, biological, aerobic, anaerobic, primary, secondary and tertiary (advanced) treatments.
- Handling customer and complains - types of complains, handling customer complains, evaluation and solution of problem, report making, CAPA.

PRACTICALS:

1. Enlist the various components of food industry, their functions and responsibilities.
2. Identification of challenges in raw material procurement in food industry and find out probable solutions.
3. Identification of challenges in food production and find out probable solutions in food industry.
4. Identification of challenges in food safety and quality control and find out probable solutions in food industry.
5. Maintenance of HACCP in Food Industry – GMP, GHP, CIP.
6. Drawing layouts of various food processing units.

INPLANT TRAINING -

Students are required to take up an internship of minimum of 45 days in any food industry, quality control department, quality control laboratories, research and development department, Nutraceutical industry, Marketing department, Production unit. At the end of internship students are required to submit a hard-bound report. A report on the training which is required to submit consists of:

1. A general overview of the plant.
2. The products & raw material sources of the plant.
3. Detail description of different processing.
4. Scheduling of plant operations.
5. Unit operations in the Industry
6. Quality Control
7. Marketing.
8. A certificate of internship issued by the Industry/Institution.

❖ A viva will be conducted after submission of the report and presentation of a seminar.

REFERENCES

1. Balla, J., Balog, J., Šafáriková, J., & Štefániková, M. (2003). Quality Management in the Machinery Maintenance in Agricultural and Food Sector. *IMprovingVOCationalEDucation*, 1.
2. Marriott, N. G., Gravani, R. B., & Schilling, M. W. (2006). *Principles of food sanitation* (Vol. 22). New York: Springer.
3. Kelly, A. (2006). *Plant maintenance management set*. Elsevier.
4. Patty, F. A. (1948). Industrial Hygiene and Toxicology. Vol. 1. *Industrial Hygiene and Toxicology. Vol. 1*.
5. Khatkar, B. S. (Ed.). (2007). *Food Science and Technology*. Daya Books.
6. Hubbard, M. R. (2012). *Statistical quality control for the food industry*. Springer Science & Business Media.

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

CO1 Apply their knowledge and skills to work in their placement food industry.

CO2 Use effective oral and written communication skills in the areas of production, quality control and Marketing of the respective industries.

CO3 Work independently and professionally as part of a team in a workplace environment.

CO4 Demonstrate the role of a food technologist in the significant activities of food industry.

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

SRI VENKATESWARA UNIVERSITY: TIRUPATI
Model Question paper
M.Sc (Home Science) Degree Examination
Third Semester
(Specialization: MS Food Technology)
(CBCS for the students admitted from 2021-22 onwards)
Paper-V: FT-305: FOOD INDUSTRY MANAGEMENT
(Skill Oriented Course)

Time : 1 1/2 hours

Max Marks:40

SECTION- A

Answer any TWO of the Following

Each question carries 5 marks

Marks: 2x5=10

1. Write the status of global food industry.
2. Write about MOFPI and its objectives.
3. Explain 5'S in food industry.

4. Principles of HACCP.

SECTION- B

Answer ALL questions

Each Question carries 15 Marks

2x15=30 Marks

5. (a). Enumerate the components in food industry.

(or)

(b). Write about :Future priorities in Food Production and schemes for Infrastructure development.

6. (a). Explain the importance of Waste treatment. Write types and methods of treating waste management?

(or)

(b). Role of complaints in food processing. Write the types of consumer complaints and handling methods and evaluation?

FT-306-A: FUNDAMENTALS OF FOOD NUTRITION AND HEALTH

Course Objectives - To enable the students to:

1. Gain knowledge on foods, food groups, balanced diet for different age groups.
2. Understand the importance of macro and micronutrients in daily diet.
3. Comprehend knowledge on deficiency symptoms of different nutrients.
4. Apply skills to assess on nutritional problems in community.

OPEN ELECTIVE - THEORY

UNIT-I: Food Composition

- Food groups –Definition, Classification.
- Food composition and nutritive values of different foods, Functions of foods.

- Balanced Diet and RDA for all age groups.

UNIT-II: Macronutrients

- Carbohydrates: Definition, classification, food sources, Function in human body, Recommended Daily Allowance (RDA) and importance of fibre.
- Fats and Oils: Definition, classification, saturated and unsaturated fatty acids, cholesterol, Food sources, requirements, RDA and biological functions.
- Protein: Definition, classification, essential and non-essential amino acids, protein quality, supplementary value of protein, food sources, RDA and functions.

UNIT-III: Micronutrients

- Vitamins: Definition, classification
- Fat soluble Vitamins (A, D, E, K) - Functions, sources, RDA, Deficiency diseases and symptoms.
- Water soluble Vitamins (B complex and C): Functions, sources, RDA, Deficiency diseases and its symptoms.
- Macro minerals: Calcium, phosphorous, sodium, potassium, chloride- sources, biological functions, factors affecting availability, Deficiency diseases and symptoms.
- Micro minerals: Copper, zinc, Iron, Iodine and fluorine in human nutrition, biological functions, factors affecting availability, Deficiency diseases and symptoms.

UNIT-IV: Major Nutritional Problems of the Community

- Malnutrition - PCM, obesity, micronutrient malnutrition, government programmes to eradicate PCM, vitamin-A, iron and iodine deficiencies, principles of planning diets for different conditions of malnutrition.

REFERENCES

1. Swaminathan, M. (1999). Essentials of Food and Nutrition, Vol. I and Vol. II Ganesh and co. Madras.
2. Mahtabs. Bamji and N.PralhadRao. (2004). "Text book of Human Nutrition, Second Edition, Oxford and IBH Publishing co. PVT LTD. New Delhi,
3. C.Gopalan, B.V.RamasastriandS.C.BalaSubramanian.(2012). Nutritive Value of Indian Foods. National Institute of Nutrition, Indian Council Medical Research Hyderabad.
4. M Swami Nathan. (2010). Food and Nutrition Volume-2 Second Edition the Bangalore Printing and Publishing Co Ltd Bangalore 560018.
5. Nutrient Requirements and Recommended Dietary Allowance for Indians A Report of the Expert Group of Indian Council Medical Research.2010.
6. Dietary guidelines for Indians- a manual. National institute of nutrition. Hyderabad. 2011.
7. David L. Kartz. (2008). Nutrition in Clinical Practice. Lippincott Williams and Wilkins. USA.

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

CO1 Acquire knowledge on food groups and functions of food.

CO2 Gain knowledge on importance of macro and micronutrients in different age groups.

CO3 Identify signs and symptoms of different nutrient deficiencies.

CO4 Illustrate the nutritional problems in community.

SRI VENKATESWARA UNIVERSITY:: TIRUPATI

Model Question Paper

M.Sc. (Home Science) Degree Examination

Third Semester

Open Elective

(CBCS for the students admitted from 2021-22 onwards)

Paper-VI:FT- 306-A: FUNDAMENTALS OF FOOD NUTRITION AND HEALTH

Time: 3 Hrs

Max: 80 Marks

Part – A

Answer any four questions

Each question carry equal marks

(4X5=20 Marks)

- 1.
- 2.
- 3.
- 4.

- 5.
- 6.
- 7.
- 8.

Part – B

Answer all questions
Each question carry equal marks **(4X15 = 60 Marks)**

9. a)

(Or)

b)

10. a)

(Or)

b)

11. a)

(Or)

b)

12. a)

(Or)

b)

FT – 306-B: DYNAMICS IN FOOD PREPARATION

Course Objectives- To enable the students to:

1. Learn the principles of safe food preparation and food pyramid.
2. Gain knowledge on cooking methods and effect of cooking on nutrients.
3. Apply knowledge about effect of cooking on nutrients.
4. Able to differentiate different cooking equipment and role of different food items in cookery.

OPEN ELECTIVE- THEORY

UNIT-I: Introduction

- Definitions in food science.
- Composition and functions of foods.
- Food pyramid.
- Principles of safe food preparation.

UNIT-II: Cooking Process

- Objectives of Cooking.

- Preliminary preparations.
- Cooking methods- Moist heat methods, Dry heat methods; Fat as medium of cooking, Microwave cooking.
- Effect of cooking on Nutrients.

UNIT-III: Cooking Equipments

- Types of cooking equipments- Grill, Boiler, Oven and Microwave. Mechanical processing equipments- Vegetable Peeler, Chopper, Mixer, Slicing machine and mincing equipment.
- Non cooking equipment: Refrigerator.

UNIT-IV: Role of Foods in Cookery

- Role of cereals, pulses, fats/oils, milk and milk products, flesh foods, sugars, vegetables, fruits and spices in cookery.

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. ShubhanginiA.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 to:

- 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.

SRI VENKATESWARA UNIVERSITY:: TIRUPATI

Model Question Paper

M.Sc. (Home Science) Degree Examination

Third Semester

Open Elective

(CBCS for the students admitted from 2021-22 onwards)

Paper-VI: FT – 306-B: DYNAMICS IN FOOD PREPARATION

Time: 3 Hrs

Max: 80 Marks

Part – A

Answer any four questions

Each question carry equal marks

(4X5=20 Marks)

- 1.
- 2.
- 3.
- 4.

- 5.
- 6.
- 7.
- 8.

Part – B

Answer all questions
Each question carry equal marks

(4X15 = 60 Marks)

9. a)

(Or)

b)

10. a)

(Or)

b)

11. a)

(Or)

b)

12. a)

(Or)

b)

IV SEMESTER

**DEPARTEMNT OF HOME SCIENCE
M S FOOD TECHNOLOGY
CHOICE BASED CREDIT SYSTEM (CBCS)
(With effect from academic year 2021-22 onwards)**

SEMESTER IV

**FT- 401: FOOD SAFETY STANDARDS AND QUALITY CONTROL
(Common to MS Food Technology and M.Sc Food Science Nutrition & Dietetics 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 assurance of food quality.

CORE - 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, Alcoholic 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 hazards.
- Intentional/ Desirable constituents-chelating agents,acids,bases,buffer systems and salts; stabilizers,thickeners,polyhydrocalcinols,anticaking,firming,clarifyingand bleaching agents; antioxidants, non- nutritional sweeteners, 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,
- Contaminants and quality standards Spices and Condiments,
- Contaminants and quality standards Water and Beverages,
- Contaminants and quality standards Food grains and Flours,
- Contaminants and quality standards of Sweeteners- Sugar, Jaggery, Honey.

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.,Pangborn 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 completion of this course, students will be able to:

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

CO 2 Identify the contaminants and additives in foods.

CO 3 Select the appropriate analytical technique when presented with a problem.

CO 4 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	3
CO2	3	3						3				3	3	3
CO3	3	3		1	3	1		3				3	3	3
CO4	3	2		1	3	1		3				3	3	3

High-3, Medium-2, Low-1

SRI VENKATESWARA UNIVERSITY::TIRUPATI

Model Question paper

M.Sc., (Home Science) Degree Examination

Fourth Semester

(CBCS for the students admitted from 2021-22 onwards)

Paper-I:FT-401:FOOD SAFETY STANDARDS AND QUALITY CONTROL

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

Time: 3 hours

Max Marks:80

SECTION- A

Answer any FOUR of the Following

Each question carries 5 marks

Marks: 4x5=20

1. Differentiate between subjective Evaluation and objective Evaluation
2. Write about triangle test.
3. Define organic foods as per FSSAI.

4. Write arethe powers of Food inspectors.
5. Write about lead toxicity
6. What are stabilizers?
7. What are common adulterants in milk?
8. How adulterants can be detected in Honey.

SECTION- B

Answer ALL questions
Each Question carries 15 Marks Marks 4x15 =60

- 9.(a). Write an account of methods of objective evaluation to assess the Food quality
(or)
(b). Write the most common microbial tests of food evaluation.
10. (a). Describe about the rules and regulations Packaging and Labelling.
(or)
(b). Discuss about the International Food Standards CODEX and HACCP principles.
- 11.(a). Write a short notes on desirable constituents of anticaking agents and propellants.
(or)
(b). Classify the food contaminants based on the type in food with examples.
- 12.(a). Describe the methods of identifying the common contaminants in fats and oils.
(or)
(b). What are the major contaminants in meat, poultry, Eggs and fish ? How can they be eliminated during Preservation and storage.

FT- 402: FOOD PRODUCT DEVELOPMENT AND MARKETING

(Common to MS Food Technology and M.Sc. Food Science Nutrition & Dietetics 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 speciality food products and their applications.
4. Acquire the skill to design and development of new food product and analyse the quality of the product.

CORE –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

In Food Industry

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

In Food ingredient and service Industry

- Characteristics, Consumers and Costumers, market places.
- Development of products for food service and ingredient industries.
- Quality and Safety of the products.

UNIT-III: Food Product Commercialization and Marketing

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

UNIT-IV: Food Products with reference to

- 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.

REFERENCES

1. Debashri, Ray.(2002). *Nutritional Challenge and Total Quality Management*, 1stedition;Sarup and Sons, New Delhi.
2. Gordon W.Fuller (2011), *New Food Product development*, 3rd edition, CRC press, Newyork.
3. Graf, E. and Saguy, I.S. (1991).*Food Product Development: From Concept to the Market Place*, Van Nostrand Reinhold New York.
4. Howard R.Moskowitz,(2009), *An integrated approach to new product development*, CRC press, Newyork.
5. Man, C.M.D. and Jomes, A.A.(1994).*Shelf life Evaluation of Foods*, Blackie Academic and Professional, London.
6. Mike Stringer and Colin Dennis.(2002). *Chilled foods A comprehensive guide*, 2ndedition, Woodhead publishing limited, Cambridge, England, 2000.
7. Oickle, J.G. (1990).*New Product Development and Value Added*, Food Development Division Agriculture, Canada.

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

CO1Apply a product development process to generate ideas, develop concept to test market.

CO2Design 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.

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

High-3, Medium-2, Low-1

SRI VENKATESWARA UNIVERSITY::TIRUPATI

Model Question paper

M.Sc(Home Science) Degree Examination

Fourth Semester

(Specialization: MS Food Technology)

(CBCS for the students admitted from 2021-22 onwards)

Paper-II:FT- 402:FOOD PRODUCT DEVELOPMENT AND MARKETING

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

Time : 3 hours

Max Marks:80

SECTION- A

Answer any FOUR of the Following

Each question carries 5 marks Marks: 4x5=20

1. Define new food product?Write the characteristics of a new product.
2. Explain the need of developing new products at an industrial level?

3. How to design a new product development? Explain.
4. What are the specific characteristics should be considered while designing a product for nutritional and health needs?
5. Write a brief note on test marketing and its types?
6. Write the procedure to apply and receive the patent for new product?
7. Differentiate pre and probiotics with suitable examples?
8. Define Health foods? Write the specifications to be followed in designing a health food.

SECTION- B

Answer ALL questions

Each Question carries 15 Marks

4x15 =60 Marks

9. (a). Classify the different new food products emerging into the food marketing.
(or)
(b). What are the various factors affecting new food product development designing.
10. (a). Explain in detail about the different phases in product design and Formulation?
(or)
(b). Enumerate the shelf life testing procedures in new product development.
11. (a). Describe costing and pricing? Explain the process of food product commercialization and marketing.
(or)
(b). Discuss the concept, types and qualities of entrepreneurship?
12. (a). Write about the characteristics and specifications for therapeutic and value added foods?
(or)
(b). Give a detailed note on functional foods and Nutraceuticals?

FT –403-A: NUTRITION FOR HEALTH AND FITNESS

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

Course Objectives - To enable the students to:

1. Define the concepts of Health, Nutrition, physical activity, physical fitness and methods of evaluation.
2. Understand the Energy metabolism pathways during physical activity.
3. Describe the role of macronutrients in physical performance, weight management and obesity.
4. Explains the nutritional needs in different sports and the role of national agencies.

GENERIC ELECTIVE -THEORY

UNIT-I: Physical Fitness and its Evaluation

- Definitions- Nutrition, Health, Physical activity and Physical Fitness.

- Health benefits of Physical activity and Recommendations,
- Components of physical fitness to overall health-Cardiovascular Fitness, Muscular strength, Muscular Endurance, Flexibility, and Body composition.
- Assessment criteria of age specific fitness and health status- Evaluation of physical fitness- FITT Principles-Talk test, Target heart rate, Borg scale.

UNIT-II: Energy Metabolism in Physical Activity and Weight Management.

- Aerobic and Anaerobic metabolic pathways-ATP-Creatine Phosphate pathway (ATP-CP), Creatine Phosphate(CP), Lactic acid cycle, Glycolysis, Krebs cycle(TCA), Gluconeogenesis.
- Energy requirements and assessment of energy expenditure based on physical activity, Carbohydrate Loading.
- Special conditions- Weight management and Obesity-Dietary modifications- Restricted energy and fat diets, Low glycemic diets, Formula diets and meal replacement programs.

UNIT-III: Nutritional and Physical Performance

- Nutritional Requirements during Exercise- Carbohydrate, Fat, Protein- Recommendations- Before, During and After exercise.
- Carbohydrate utilization during exercise, Role of protein and fat in daily training and competitive performance.
- Vitamins and Minerals-Importance and Recommendations.
- Fluid-Recommendations, Importance and Consequences of Fluid balance. Hydration in pre, during and post exercise.

UNIT-IV: Sports Nutrition

- Classification of sports events and RDA for sports person.
- Nutritional requirements and special needs of sports person, pre, during, post sports events, water and electrolyte balance, ergogenic aids.
- Endurance and fatigue in sports performance.
- Assessment-Kinanthropometry: Definition; Introduction; Body size and proportion; Somatotyping; Circumferences; Skinfold measurement sites and determining body composition; Applications.
- Role of National agencies towards improvements of sports performance.

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- Upon 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	3
CO2	3	2										1	3	3
CO3	3		3									1	3	3
CO4	3			2	2							2	3	3

High-3, Medium-2, Low-1

SRI VENKATESWARA UNIVERSITY::TIRUPATI

Model Question paper

M.Sc(Home Science) Degree Examination

Fourth Semester

(CBCS for the students admitted from 2021-22 onwards)

Paper-III:FT- 403-A:NUTRITION FOR HEALTH AND FITNESS

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

Time : 3 hours

Max Marks:80

SECTION- A

Answer any FOUR of the Following

Each question carries 5 marks

Marks: 4x5=20

1. Define the cardiac and muscle endurance.
2. What is BORG Scale?
3. Write briefly glycolysis energy pathway.
4. What is BMI? How do you assess the BMI?
5. How do you calculate protein requirements for different levels of exercise?
6. Write the importance of vitamins in exercise.
7. Write pre fluid requirements for an athlete.
8. Write the importance of Ergogenic foods in sports performance.

SECTION- B

Answer ALL questions

Each Question carries 15 Marks

Marks 4x15 =60

- 9.(a). Explain about the interrelationship between physical fitness and health
(or)
- (b). How do you assess fitness using FITT principle.
- 10.(a). Explain in detail the fat metabolism before, during and after exercise.
(or)
- (b). Explain how the anaerobic energy cycles contribute energy during heavy exercise.
- 11.(a). Write the role of macro nutrients in supporting physical activity.
(or)
- (b). What are the adverse health effects of dehydration or hypo hydration?
12. (a). Describe the assessment of nutritional status of sports person.
(or)
- (b). What is Kinanthropometry, explain different measurements.

FT 403-B: UNIT OPERATIONS IN FOOD INDUSTRY

Course Objective To enable the students to:

1. Understand the principle of Unit operation in food industry.
2. Learn important preliminary operations in food processing industries.
3. Impart knowledge on Safety, sanitation and Effluent Treatment in food industry.
4. Know the different pre and post processing operations as storage and packaging foods etc.

GENERIC ELECTIVE- THEORY

UNIT-I: Food Industry

- Plant and machinery for different types of Food Industries and processing Units of

1. Cereals, Pulses and legumes, 2. For oil seeds, 3.Sugars and sugar products, 4. Vegetables and Fruits, 5.Milk and Milk products, 6.Eggs, poultry and meat products, 7.Fish and Sea foods, 8.Beverages, 9.Spices and condiments, etc.
- Management Systems In Food Industry at different Stages and for different components like, power supply electricity - water, procurement of raw material - Storage - product production - preservation.

UNIT-II: Mechanical Operations

- Size reduction: Introduction, Grinding and Cutting – Equipments.
- Filtration: Definition –filter media – Principles of cake filtration, Specific cake resistance. Types of membranes.
- Mixing of liquids and solids (powder), mixing equipment, mixing index and mixing time, Agitation and blending, types of agitators, power consumption in mixing.

UNIT-III: Material Handling

- Belt conveyor: Principle of operation, characteristics. Chain conveyor: Principle of operation, advantages, disadvantages. Screw conveyor: Principle of operation, inclined and vertical screw conveyors
- Bucket elevator: Principle, classification, operation, advantages, disadvantages. Pneumatic conveying system: Types, air/product separators. Gravity conveyor design considerations, capacity and power requirement.

UNIT-IV Food Safety & Sanitation

- Safety and Sanitation - Safety and Hygienic practices, Hazards and Risks- Industrial Effluent Treatment.
- ISO 14000: Introduction, various standards among 14000 series, certification and its importance, CIP & COP.

REFERENCES

1. D. G. Rao, Fundamentals of food engineering, Prentice-Hall of India, New Delhi, 2010
2. R. Paul Singh and Dennis R. Heldman, Introduction to Food Engineering, 4th Edition, Academic Press, 2009.
3. Z. Berk, Food Process Engineering and Technology, Food Science and Technology, 1st Edition, International Series, Elsevier, 2009.
4. J.M. Smith, H.C. Van Ness and M.M. Abbott. 2005. Introduction to Chemical Engineering Thermodynamics, 7th Ed. McGraw-Hill, Inc., NY, USA.

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

- CO1** Understand and comprehend the principle of unit operations in food industry
- CO2** Operate important preliminary operations in food processing industries
- CO3** Choose suitable packaging materials for different foods.
- CO4** Identify the suitable unit operations for a specific purpose.

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	1						3	3	3
CO3	3	2						1				3	3	3
CO4	3				3							3	3	3

High- 3, Medium- 2, Low- 1

SRI VENKATESWARA UNIVERSITY::TIRUPATI
Model Question paper
M.Sc (Home Science) Degree Examination
Fourth Semester
(Specialization: MS Food Technology)
(CBCS for the students admitted from 2021-22 onwards)
Paper-III: FT-403-B:UNIT OPERATIONS IN FOOD INDUSTRY

Time : 3 hours

Max Marks:80

SECTION- A

Answer any FOUR of the Following

Each question carries 5 marks

Marks: 4x5=20

1. Enlist the processing Equipments used in Beverage Industry?
2. Write short note on Procurement and Storage of Raw materials?

3. Differentiate between Grading and Cutting?
4. What are different types of membranes and filtrates?
5. Explain about Screw Conveyors?
6. Write about Pneumatic conveying system?
7. Explain about the safety and hygiene practices followed in food industries?
8. Write about the CIP system?

SECTION- B

Answer ALL questions

Each Question carries 15 Marks

4x15 =60 Marks

- 9.(a). What are the factors affecting the rate of evaporation?
(or)
(b).What are the common Food Processing operations employed in processing the food?
- 10.(a).Explain about different equipments used for cutting for sizing of food?
(or)
(b).Explain in detail about gravitational sedimentation of particles in fluids??
- 11.(a).Write about Principal of Conveying systems in Food Processing Industry?
(or)
(b).Write the principle of drying? Explain about pneumatic drying?
- 12.(a).Write in detail about effluent treatment?
(or)
(b).How ISO 14000 is used in food industries and different series in ISO 14000?

PRACTICALS: FT-404: FOOD SAFETY STANDARDS AND QUALITY CONTROL
+ FOOD PRODUCT DEVELOPMENT AND MARKETING

FT- 401: FOOD SAFETY STANDARDS AND QUALITY CONTROL

Course Objectives

- Gain knowledge on subjective and objective methods.
- Learn the methods of contaminants in food for quality assurance.

PRACTICALS:

Assessment of quality parameters and adulterants in different foods

1. Survey of label information of foods in market
2. Cereals, Pulses and Flours – Label information, detection of adulterants
3. Fats and oils – Label information, Adulterant tests, Iodine number and FFA Value
4. Fruit and vegetable products – Label information, Acidity , TSS, Sugars
5. Coffee and Tea, Honey – Label information, Detection of Adulterants
6. Milk and milk products- Label information, COB test, Acidity, MBRT, Detection of adulterants.
7. Spices and Condiments- Label information, Detection of adulterants.
8. Determination of different Preservatives
9. Determination of different Colors
10. Document preparation for the approval of FSSAI.

Course Outcomes

CO1 Select the appropriate analytical technique when presented with a problem.

CO2 Demonstrate practical proficiency in a food quality analysis.

FT- 402: FOOD PRODUCT DEVELOPMENT AND MARKETING

Course Objectives:

- Exemplify various speciality food products and their applications.
- Acquire the skill to design and development of new food product and analyse the quality of the product.

PRACTICALS:

New Food Product Development and Marketing

1. Ideation.
2. Concept Development.
3. Market research.
4. Formulation and Standardization.
5. Acceptability studies.
6. Shelflife Studies.
7. Costing and Pricing.
8. Food and Nutrition labeling and packaging.
9. Development of Product Promotion strategies.
10. Test Marketing.

Course Outcomes

CO1 Demonstrate the skills to conduct the organoleptic evaluation of food product.

CO2 Work collaboratively with a team in food product development.

FT-405: TECHNOLOGY OF PACKAGING
(Common to MS Food Technology and M.Sc., Food Science Nutrition & Dietetics 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. Knowledge of the new innovations in food packaging to improve product stability and/or to extend the product shelf-life.

MULTI DISCIPLINARY COURSE

UNIT- I: Introduction and Types of Packaging

- Principles of food packaging, Functions of packaging; Type of packaging materials- Paper and Paperboard, types of paper, Glass, Metal and Plastic- Thermosets and Thermoplastics.
- Selection of packaging material for different foods. Methods of packaging and packaging equipment.
- Packaging-Food Interactions: Factors affecting flavor absorption, the role of the food matrix, the role of differing packaging materials, Flavor modification and sensory quality.

UNIT- III: Food Packaging System

- Active and Intelligent Packaging Techniques: Active packaging techniques, intelligent packaging techniques, Consumers towards and novel packaging.
- Aseptic Packaging Technology-advances, systems and its food applications, packaging for high pressure processing.
- Oxygen, ethylene and other scavengers: Oxygen scavenging technology, Selecting the right type of oxygen scavenger, Ethylene scavenging technology, Carbon dioxide and other scavengers.

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.
6. Drop test, Box compression test.
7. Measurement of grease resistance of papers.
8. Head space analysis of packaged food.

REFERENCES

1. Robertson GL,(2012) *Food Packaging – Principles and Practice*, CRC Press Taylor and Francis Group
2. Ahvenainen. R. (2003).*Novel Food Packaging Techniques*:CRC Publications.
3. RaijaAhvenainen (2003) *Novel food packaging techniques*, Published by Woodhead Publishing Limited.
4. F. A. Paine and H. Y. Paine (1992) *A Handbook of Food Packaging*, 2nd edn Blackie Academic and Professional, London.

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

CO1Exposure about packaging, packaging materials and packaging methods.

CO2Comprehend the overview of the scientific and technical aspects of food packaging

CO3Acquire knowledge on regulations of packaging and testing.

CO4Able 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

SRI VENKATESWARA UNIVERSITY::TIRUPATI

Model Question paper

M.Sc (Home Science) Degree Examination

Second Semester

(CBCS for the students admitted from 2021-22 Onwards)

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

Paper-V:FT-405: TECHNOLOGY OF PACKAGING

Time :1.30 hours

Max Marks:40

SECTION- A

Answer any TWO of the Following

Each question carries 5 marks Marks: 2x5=10

1. Write about the Principles and Functions of Food Packaging

2. Enlist different Types of Packaging materials used for Food Packaging?
3. Explain in brief about
 - A) Water Vapor Transmission Rate
 - B) Gas Transmission Rate
4. What are the different factors affecting Flavor Absorption ?

SECTION- B

Answer ALL questions
Each Question carries 15 Mark Marks: 4x15 =60

- 9.(a). Write in detail about Thermosets and Thermoplastics?
(OR)
(b). What are the different Methods used for Food Packaging?
10. (a)What is meant by Barcode? Explain in brief about Barcoding and their Types?
(OR)
(b). Explain in detail about the role of Food Matrix in Packaging- Food Interactions?

FT-406-A: CHILD GROWTH AND DEVELOPMENT

Course Objectives-To enables the students to:

1. Know the terms growth , development and stages of development across life span
2. Understand the characteristics of children at different stages of childhood
3. Explain the different developments like physical, cognitive, language and social development during childhood.
4. Apply knowledge to understand normal development and developmental delays during childhood.

OPEN ELECTIVE –THEORY

UNIT-I: Foundations of Development

- Understanding the terms Child, Growth, Development, Child Development, Human Development, and Developmental tasks.
- Principles of Child Development and Factors influencing growth and Development of Children.
- Determinants of Development - Role of Heredity and Environment in Development
- Stages of Development across life span and domains of development.

UNIT-II: Infancy

- Infancy – Characteristics
- Sensory- Motor activities
- Language Development
- Socio-emotional development.

UNIT-III: Early Childhood

- Early Childhood Period –Characteristics
- Physical Development
- Cognitive development
- Emotional and Social development

UNIT-IV: Middle Childhood

- Middle/ Late Childhood Period-Characteristics
- Physical development
- Cognitive development.
- Emotional and Social development

REFERENCES

1. Berk, L. E. (2007). Child Development. Prentice-Hall of India Pvt.Ltd, New Delhi.
2. Feldman, R.S. (2011).Understanding Psychology, Tenth Edition. Tata MCGraw Hill Education Private Limited, McGraw- Hill, New Delhi.
3. Hallahan, D.P. and Kauffman, J.M. (1991). Introduction to exceptional children.

5th ed. Allyn and Bacon, Boston.

4. Hurlock – E.B. (1990) Child Development , Tata McGraw Hill Company Ltd, New York. McGraw- Hill, New Delhi.
5. Rozario, J. and Karanth, P. (2003). Learning disability in India. Sage publication, New Delhi.
6. Santrock, J. W. (2013). Child Development. Tata McGraw Hill Company Ltd, New Delhi.
7. Singh, A. (Ed).(2015). Foundations of Human Development: A life span approach. Tata McGrawHill ,New Delhi.
8. Prasad, J. and Prakash, R. (1996). Education of handicapped children, problems and solution. Kanishka publication distribution. New Delhi.

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

CO1 Define the terms growth and development, and stages of development across

life span

CO2 Understand the characteristics of children at different stages of childhood

.

CO3 Critically explain different developments like physical, cognitive , language

and social development during childhood

CO4 Apply knowledge to understand normal development and developmental

delays during childhood to assess all round development during childhood

Model Question Paper
M.Sc. (Home Science) Degree Examination
Fourth Semester
Open Elective
(CBCS for the students admitted from 2021-22 onwards)
Paper-VI:FT-406 -A: CHILD GROWTH AND DEVELOPMENT

OPEN ELECTIVE

Time: 3 Hrs

Max: 80 Marks

Part – A

Answer any four questions
Each question carry equal marks **(4X5=20 Marks)**

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

Part – B

Answer all questions
Each question carry equal marks **(4X15 = 60 Marks)**

9. a)

(Or)

b)

10. a)

(Or)

b)

11. a)

(Or)

b)

12. a)

(Or)

b)

FT406-B: DISASTER MANAGEMENT

Course Objectives - To enable the students to:

1. Know about natural disasters: manmade disasters; chemical hazards; National and International strategies to mitigate disaster management.
2. Understand natural disasters (like floods, drought, cyclone, earthquakes, global warming etc); Nuclear disasters; Biological disasters;.
3. Illustrate the efforts made by the NGOs, Community based organizations and local administration in disaster management.
4. Discriminate disaster responses of Armed forces and Police.

OPEN ELECTIVE- THEORY

UNIT-I: Natural Disasters

- Meaning and nature of natural disasters, their types and effects.
- Floods, Drought, Cyclone, Earthquakes, Landslides, Avalanches, Volcanic eruptions, Heat and cold Waves.
- Climatic Change: Global warming, Sea Level rise, Ozone Depletion.

UNIT-II: Man Made Disasters

- Nuclear disasters, biological disasters, building fire, coal fire, forest fire. Oil fire, air pollution, water pollution.
- Deforestation, Industrial wastewater pollution, road accidents, rail accidents, air accidents, sea accidents.

UNIT-III: Chemical Hazards

- Release of Toxic chemicals.
- Sedimentation processes.
- Global Sedimentation Problems.
- Regional Sedimentation Problems, Sedimentation and Environmental Problems.

UNIT-IV: Disaster Management

- Efforts to mitigate Natural Disasters at National and Global levels.
- International Strategy for Disaster reduction.
- Concept of disaster management, National Disaster Management framework; financial arrangements
- Role of NGOs, Community-based organizations, and Media. Central, State, District and local Administration; Armed forces in Disaster response
- Disaster response: Police and other organizations.

REFERENCES

1. Gupta, H.K. (2003). *Disaster management*. Indian National Science Academy. Orient Blackswan.
2. Hodgkinson, P.E. & Stewart, M. (1991). *Coping with catastrophe: A handbook of disaster management*.
3. Routledge. and Sharma, V.K. (2001). *Disaster management*. National Centre for Disaster Management, India.

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

CO1 Gain in-depth knowledge about natural disasters; manmade disasters; chemical hazards: disaster management.

CO2 Design and administer a schedule for collection of Information regarding the roles of NGOs, Community based organizations , central state, District and local Administration, Police and armed forces, in Disaster management.

CO3 Illustrate the efforts made by the NGO's, community based organization and local administration in disaster management.

CO4 Discriminate disaster responses of Armed forces and police.

SRI VENKATESWARA UNIVERSITY:: TIRUPATI
Model Question Paper
M.Sc. (Home Science) Degree Examination
Fourth Semester
Open Elective
(CBCS for the students admitted from 2021-22 onwards)
Paper-VI: FT-406-B:DISASTER MANAGEMENT

Time: 3 Hrs

Max: 80 Marks

Part – A

Answer any four questions
Each question carry equal marks

(4X5=20 Marks)

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

8.

Part – B

**Answer all questions
Each question carry equal marks**

(4X15 = 60 Marks)

9. a)

(Or)

b)
10. a)

(Or)

b)
11. a)

(Or)

b)
12. a)

(Or)

b)