

IFTM UNIVERSITY, MORADABAD
M.Sc. Home Science (Food and Nutrition), Degree Programme
Effective from Session 2022-23

YEAR I, SEMESTER I

S. N.	Semester		Course code	Theory Course (Name Of The Paper)	Periods			EVALUATION SCHEME (Marks)				Course Total (Marks)	Credits
	1.	Section			L	T	P	Mid Semester Exam			End Semester Exam		
								MS 1+2	AS +AT	Total			
THEORY													
1.	CC-01	MHSCFN-101T	Human Physiology	3	1	0	10+10	5+5	30	70	100	4	
2.	CC-02	MHSCFN-102T	Advanced Food Science - I	3	1	0	10+10	5+5	30	70	100	4	
3.	CC-03	MHSCFN-103T	Institutional Food Management -I	3	1	0	10+10	5+5	30	70	100	4	
4.	CC-04	MHSCFN -104T	Research Methods and Statistics - I	3	1	0	10+10	5+5	30	70	100	4	
PRACTICAL													
5.	CC-05	MHSCFN -151P	Human Physiology (Practical)	-	-	4			30	70	100	2	
6.	CC-06	MHSCFN -152P	Advanced Food Science – I (Practical)	-	-	4			30	70	100	2	
			TOTAL	12	4	8					600	20	

YEAR I, SEMESTER-II

S. N.	Semester		Course Code	Theory Course (Name Of The Paper)	Periods			EVALUATION SCHEME				Course Total	Credits
	2.	Section			L	T	P	Mid semester Exam			End semester Exam		
								MS 1+2	AS +AT	Total			
THEORY													
1.	CC-07	MHSCFN-201T	Food Microbiology	3	1	0	10+10	5+5	30	70	100	4	
2.	CC-08	MHSCFN -202T	Advanced Food Science - II	3	1	0	10+10	5+5	30	70	100	4	
3.	CC-09	MHSCFN-203T	Institutional Food Management -II	3	1	0	10+10	5+5	30	70	100	4	
4.	CC-10	MHSCFN-204T	Research Methods and Statistics - II	3	1	0	10+10	5+5	30	70	100	4	
PRACTICAL													
5.	CC-11	MHSCFN-251P	Food Microbiology (Practical)	-	-	4	-	-	30	70	100	2	
6.	CC-12	MHSCFN-252P	Advanced Food Science – II (Practical)	-	-	4	-	-	30	70	100	2	
			TOTAL	12	4	8					600	20	

YEAR II, SEMESTER-III

S.N.	Semester 3. Section	Course Code	Theory Course (Name Of The Paper)	Periods			EVALUATION SCHEME				Course Total	Credits
				L	T	P	Mid semester Exam			End semester Exam		
							MS 1+2	AS +AT	Total			
THEORY												
1.	CC-13	MHSCFN-301T	Clinical & Therapeutic Nutrition - I	3	1	0	10+10	5+5	30	70	100	4
2.	CC-14	MHSCFN – 302T	Food Product - Development Safety and Quality Control	3	1	0	10+10	5+5	30	70	100	4
PRACTICAL												
3.	CC-15	MHSCFN – 351P	Clinical & Therapeutic Nutrition – I (Practical)	-	-	4	-	-	30	70	100	2
4.	CC-16	MHSCFN – 352P	Food Product - Development Safety and Quality Control (Practical)	-	-	4	-	-	30	70	100	2
5.	(Choose any one of the following after consulting to the Department) DE- MHSCFN – 303T											
	DE- 1	MHSCFN – 303T (A)	Advanced Nutrition - I	3	1	0	10 +10	5 +5	30	70	100	4
	DE- 2	MHSCFN – 303T (B)	Nutrition and weight Management									
4.	(Choose any one of the following after consulting to the Department) DE- MHSCFN – 304T											
	DE- 3	MHSCFN – 304T (A)	Programme Planning in public Health Nutrition	3	1	0	10+ 10	5+5	30	70	100	4
	DE- 4	MHSCFN –304T (B)	Nutrition Communication and Diet Counselling									
5.	(Choose any one of the following after consulting to the Department)											
	OE- 1	BHMCT - 102	Food & Beverage Services Foundation-I	3	1	0	10+ 10	5+5	30	70	100	4
	OE- 2	MFT- 301 T	Post Harvest Management of Fruits & Vegetables									
	OE- 3	MFT- 303 T	Food Quality systems & Management									
			TOTAL	15	5	8					700	24

YEAR II, SEMESTER-IV												
S.N.	semester 4. Section	Course Code	Theory Course (Name Of The Paper)	Periods			EVALUATION SCHEME			End semester Exam	Cours e Total	Credits
				L	T	P	Mid Semester Exam					
							MS 1+2	AS +AT	Total			
THEORY												
1.	CC-17	MHSCFN-401T	Clinical & Therapeutic Nutrition - II	3	1	0	10+10	5+5	30	70	100	4
2.	CC-18	MHSCFN-402T	Food Processing and Preservation	3	1	0	10+10	5+5	30	70	100	4
3.	CC-19	MHSCFN-403T	Perspectives in Public Health Nutrition	3	1	0	10+10	5+5	30	70	100	4
PRACTICAL												
4.	CC-20	MHSCFN-451P	Perspectives in Public Health Nutrition (Practical)	-	-	4	-	-	30	70	100	2
5.	CC-21	MHSCFN-452P	Dissertation	-	-	12	-	-	60	140	200	6
6.	(Choose any one of the following after consulting to the Department)			3	1	0	10+10	5+5	30	70	100	4
	OE -1	BHMCT-205	Nutrition and Food Science									
	OE -2	MFT- 202 T	Food Fermentation									
	OE -3	MFT- 203 T	Food and Nutritional Chemistry									
			TOTAL	12	4	16					700	24

*Lecture load for one section (60 students) in theory and two sections (30 students each) in practical and

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) I Year (I Semester)
MHSCFN-101T: Human Physiology

Course Objectives:

- To understand the normal functioning of various organ systems of the body and their interactions for skill development.
- To be able to comprehend the patho physiology of commonly occurring diseases for skill development.

UNIT - I

(8 Sessions)

Definition of anatomy and physiology. Importance of the study of physiology. Brief overview of the cellular and tissue levels of structural organization for skill development

Cell structure and function: Various sub cellular organelles and their functions. Transport across cell membrane and primary cellular communication

Brief overview of the various types of elementary tissues and their general characteristics

Fundamental aspects of the Nervous System –

Structure and functions of brain and spinal cord and reflex action, conduction of nerve impulse, synaptic transmission and role of neurotransmitters for skill development

UNIT - II

(8 Sessions)

Endocrine System: Main structural features and functions of endocrine glands:- Hypo-thalamus, pituitary, thyroid, parathyroid, adrenals, ovary, testis, and β endocrine cells of the pancreas for skill development

Gastrointestinal Physiology: Secretary, digestive and absorptive functions of the organs of gastrointestinal tract. Roles of liver, pancreas and gall bladder and their dysfunctions. Brief overview of absorption and transport of macronutrients: carbohydrate, fat, protein and micronutrients; calcium, iron and zinc

UNIT - III

(6 Sessions)

Circulatory System

Blood – Physical characteristics, general functions, components and their brief description, Blood coagulation, blood groups. Brief overview of anaemia and its types

Structure and function of heart, blood vessels, regulation of cardiac output, blood pressure and its significance, hypertension for skill development

Excretory System:- Structure and function of kidney, nephron. Process of urine formation, role of kidney in maintaining blood pH, acid base, electrolyte and water balance

Homeostasis and its regulation under different conditions by the nervous and endocrine system

UNIT - IV

(8 Sessions)

Muscular- Skeletal System:- Brief overview of structure and function of muscles. Types of muscles. Fundamental points of muscle contraction, metabolism and fatigue

Immune System:

Cell mediated and humoral immunity, defensive properties of neutrophils and macrophages, phagocytosis and inflammation allergy

Sense organs: Brief overview of the structure of skin, eye, ear, nose and tongue and their role in the perception of stimuli for skill development.

Course Outcomes:

Student will be able to –

- CO1. Understand the current state of knowledge about the functional organization of the human body for global skill development.
- CO2. Develop insight of normal functioning of all the organ systems of the body and their interactions for skill development.
- CO3. Comprehend the path physiology of commonly occurring diseases for skill development.
- CO4. Correlate physiology with various disorders and their pathogenesis for global skill development.

PO – CO Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	2	1
CO3	3	2	1
CO4	3	2	1

Suggested Readings:

1. Chatterjee, C. (1992). Human Physiology, (Vol I & II). Calcutta: Medical Allied Agency,
2. Sanghani, P. B. (2012). Human Anatomy and Physiology with health education. New Delhi: Tata Mc Graw Hill Education Private Limited.
3. Sharma, S. (1993). Practical Biochemistry, Jaipur: Classic Pub. House.
4. Tortora, G. J. & Derrickson, B. (2006). Principles of Anatomy and Physiology. USA: John Wiley & Sons. Inc.
5. Waugh, A. & Grant, A. (2014). Ross & Wilson Anatomy and Physiology in Health and Illness (12th ed.). New York; Churchill Livingstone, Elsevier.

Website Sources:

1. Diagram of human body organs - <https://in.pinterest.com/pin/429390145695727907/>
2. The human body: Anatomy, facts and functions

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) I Year (I Semester)
MHSCFN-151P: Human Physiology (Practical)

Course Objectives:

- To understand the normal functioning of various organ systems of the body and their Interactions for skill development.
- To and to be able to comprehend the pathophysiology of commonly occurring diseases for skill development.

Practical:

1. Determination of blood groups and clotting time for skill development.
2. Estimation of haemoglobin by cyan methemoglobin method for skill development.
3. Examination of urine : Physical examination, specific gravity, pH, Abnormal (Pathological) constituents: protein, glucose, ketone bodies, bile salts and bile pigments for skill development
4. Measurement of blood pressure for skill development.
5. Microscopic examination of cells and tissue for skill development.

Course Outcomes:

Student will be able to -

- CO1. Understand the current state of knowledge about the functional organization of the human body for global skill development.
- CO2. Develop insight of normal functioning of all the organ systems of the body and their interactions for skill development
- CO3. Comprehend the pathophysiology of commonly occurring diseases for global skill development.
- CO4. Correlate physiology with various disorders and their pathogenesis for global skill development.

PO – CO Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	2	1
CO3	3	2	1
CO4	3	2	1

Suggested Readings:

1. Ganong, W.F. (1985): Review of Medical Physiology, 12th Edition, Lange Medical Publication.
2. Moran Campbell E.J., Dickinson, C.J., Slater, J.D., Edwards. C.R.W. and Sikora, K. (1984) Clinical Physiology, 5th Edition, ELBS, Blackwell Scientific Publications.
3. Guyton, A.C. (1985) : Function of the Human Body. 4th 'edition, W.B. Sanders Company, Philadelphia.
4. Guyton, A.C. and Hall, J.B. (1996): Text Book of Medical Physiology, 9th Edition, W.B. Sanders Company, Prism Books (Pvt) Ltd., Bangalore.
5. Wilson, K.J.W. and Waugh, A. (1996): Ross and Wilson Anatomy and Physiology in Health and Illness, 8th Edition, Churchill Livingstone.

Website Sources:

1. Diagram of human body organs –
<https://in.pinterest.com/pin/429390145695727907/>
2. The human body: Anatomy ,facts and functions

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) I Year (I Semester)
MHSCFN-102T: Advanced Food Science – I

Objectives:

To study scientific principles involved in food preparation and evaluation.

- To acquire knowledge regarding processing of food to provide employability & Skills.
- To understand the principles underlying newer techniques of food preservation and packaging to provide employability & Skills.

UNIT I

(8 Sessions)

Evaluation of food: Sensory assessment of food quality, Appearance of food – size, shape & colour of foods, Flavour of foods – odour, sensory organ for detecting odour, Odour stimuli Taste of foods – sensory organ for detecting taste, Taste stimuli, Taste sensitivity, Taste interaction for skill development.

Mouth feel – pain, hot & cold sensations, tactile sensations, Texture of foods, Consistency of foods, Psychological factors in sensory assessment

Sensory testing of foods – Difference testing, Acceptance of consumer testing, Conducting sensory tests – sampling food for sensory testing, preparing samples & presenting for sensory testing and using reference samples

UNIT II

(6 Sessions)

Objective Assessment of food quality, Rheological characteristics of food, Objective tests for food, Physical Properties & physiochemical changes in foods.

Water – Types of water in foods- bound & free water , Water activity and food spoilage, Colloidal systems and its application to food preparation, Solutions, sols, gels & suspensions, Emulsions and foams, Product Development and Standardization of recipe to provide employability & Skills.

UNIT III

(7 Sessions)

Functional Role of Sugars in Foods, Crystallization of sugar, factors affecting crystallization, Stages of sugar cookery, Caramelization of sugars, Interfering agents & crystal formation, Fudge, Fondant, Caramel & brittles, Sugar Substitutes for skill development

Food Additives, Types – Preservatives, antioxidants, emulsifying agents, nutrient supplements, non-nutritive sweeteners, anti-caking agents, sequestrants bleaching agents, Salt Substitutes , Food Preservation- Low temperature, High temperature to provide employability & Skills

UNIT IV

(6 Sessions)

Flours & Starches – Composition of cereals, kind of wheat, effects of milling, types of flours, formation of dough from flour & baking quality, Development of gluten, factors affecting developing of gluten, Sources of starch & their properties, Gelatinization, Factors affecting gelatinization, Parboiling of rice and malting of grains, puffed and flake cereals

Leavening Agents- Types of leavening agents – steam, air, carbon dioxide, Baking powder, Types of baking powder, Baking soda & sour milk, Batters & dough, Cakes, Biscuits & Breads – ingredients & their functions and method of preparation knowledge for better employability in industry.

Course Outcomes:

On successful completion of the course students will be able to:

- CO 1. Apply and incorporate the principles of Food Science in practical, real-world situations and problems for skill development
- CO 2. Explain the basic principles of sensory analysis and other analytical techniques associated with food to provide national employability & Skills
- CO 3. Awareness on the concept of ‘new food product development’ and current topics of importance to the Food industry to provide employability & global Skills
- CO 4. Apply the various techniques in the quality evaluation of foods and demonstrate practical proficiency in food analysis laboratory knowledge for better national employability in industry.

PO – CO Mapping**(Please write 3, 2, 1 wherever required)****(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

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

CO- Curriculum Enrichment Mapping**(Please write 3, 2, 1 wherever required)****(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	3	1
CO3	3	3	1
CO4	3	3	1

Suggested Readings:

1. Acharya, K.T.: A Historical Dictionary Of Indian Foods, Oxford Publishing Co.
2. Belitz, H.D. and Grosch W., (1999) : Food Chemistry, (2nded), Springer, New York
3. Belle Lowe (1963) : Experimental Cookery, John Wiley And Sons Inc., New York
4. Bennion, Marion And O. Hughes (1986) :Introductory Foods, Edi : MacMilan N. Y.
5. Girdharilal, G.S. Sidappa And G.L. Tandon (1986) : Preservation Of Fruits And Vegetables, (2nd Ed), New Delhi: Indian Council Of Agricultural Research.
6. Griswold, R.M. (1979) : The Experimental Study Of Food, Houghton Mifflim Boston.
7. Lee Frank A. (1975) : Basic Food Chemistry. - Westpot Connecticut: AVI Publishers.
8. Mahindru, S.N.: Food Additives, Characteristics, Detection And Estimation, Tata McGraw Hill Publishing Co. Ltd., New Delhi.

Website Sources:

1. <https://onlinecourses.nptel.ac.in/>
2. <https://www.wikipedia.org/>

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) I Year (I Semester)
MHSCFN-152P: Advanced Food Science – I (Practical)

Objectives:

To study scientific principles involved in food preparation and evaluation.

- To acquire knowledge regarding processing of food to provide employability & Skills.
- To understand the principles underlying newer techniques of food preservation and packaging to provide employability & Skills.

Practical:

1. Use of measuring techniques and devices, weight and measures of different foods.
2. Sensory Evaluation - detection of primary flavour and sensitivity, threshold tests-triangle test, paired comparison, scoring test, ranking test for skill development
3. Objective methods – ink print, percent sag, seed displacement.
4. Sugar and Jaggery Cookery – Relative sweetness, solubility and size of sugar, stages of sugar cookery, caramelization, crystallization, factors affecting crystal formation to provide employability & Skills
5. Starches, Vegetable gums and Cereals – dextrinization, gelatinization, retrogradation, thickening powder. Factors affecting gels. Gluten formation and factors affecting gluten formation to provide employability & Skills.
6. Leavened products: fermentation - use of micro organisms (lactic acid, yeast), steam as an agent, egg as an agent, chemical agents knowledge for better employability in industry.

Course Outcomes:

On successful completion of the course students will be able to:

- CO 1. Apply and incorporate the principles of Food Science in practical, real-world situations and problems for skill development
- CO 2. Explain the basic principles of sensory analysis and other analytical techniques associated with food to provide employability & global Skills
- CO 3. Impart awareness on the concept of ‘new food product development’ and current topics of importance to the Food industry to provide employability & global Skills
- CO 4. Apply the various techniques in the quality evaluation of foods and demonstrate practical proficiency in food analysis laboratory knowledge for better national employability in industry.

PO – CO Mapping

(Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	3	1
CO3	3	3	1
CO4	3	3	1

Suggested Readings:

1. Manay S. N., (2002) : Foods, Facts And Principles, Wiley Eastern, New Delhi.
2. Meyer L.J. (1989) : Food Chemistry, CBS Publishers And Distributors, New Delhi.
3. Paul P.C. And Palmer H.H. (1972) : Food Theory And Application John Wiley And Sons, London
4. Peckham G. and Freeiand-Graves, G.H. (1979) : Foundation Of Food Preparation, Mac Millian Company
5. Potter, N. and Hotchkiss, J.H. (1996) : Food Science, Fifth ed., CBS Publishers and Distributors, New Delhi.
6. Srilakshmi B. (2000) : Food Science, New Age International (P) Ltd. Publishers, Wiley Eastern Ltd., New Delhi.
7. Swaminathan A. (2000) : Food Science And Experimental Foods, Ganesh And Company Madras,

Website Sources:

1. <https://onlinecourses.nptel.ac.in/>
2. <https://www.wikipedia.org/>

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) I Year (I Semester)
MHSCFN-103T: Institutional Food Management - I

Objectives:

- To develop a knowledge base in key areas of Institutional Food Administration to provide employability & Skills.
- To provide practical field level experience in Institutional Food Administration to provide employability & Skills.
- To impart necessary expertise to function as a Food Service Manager for better skilling of entrepreneurship.
- To equip individuals to start their own food service unit leading to entrepreneurship.
- To develop critical abilities and provide basic grounding in research techniques for skill development.

UNIT I **(5 Sessions)**

Food service systems and their development- History and Development, Factors Affecting Development of Food Service System, Types of Food Service System, Commercial and Non-commercial for better skilling of entrepreneurship.

Management - Approaches to the Food Service Management, Principles, Functions, Tools of Management

UNIT II **(6 Sessions)**

Layout and Design, Definition of layout and design, Factors affecting layout and design, Determining Work Centers, Principles of Kitchen layout, Work flow, Work simplification to provide employability & Skills.

Equipments, Classification of equipments, factors affecting selection of equipments, purchase and installation, General care and Maintenance of equipment, Cleaning systems

UNIT III **(5 Sessions)**

Purchasing Receiving and Storage, Purchasing Activity, Methods of Buying & Receiving, Methods of Delivery, Delivery Procedure and Revising Procedure, Types of Storage, Storekeeping and Store Records, Maintenance of Food Quality in Storage for skill development.

UNIT IV **(5 Sessions)**

Entrepreneurship in Food Service Management, Perspective of Entrepreneurship, Defining – Entrepreneurship, Entrepreneur, Characteristics of successful Entrepreneurs, Approaches to Entrepreneurship Development for skill development.

Course Outcomes:

On successful completion of the course students will be able to:

CO1. Describe the food service management in different setting for better skilling of local entrepreneurship. .

CO2. Estimate the various types of food service in different situation to provide employability & global Skills.

CO3 Estimate the cost of any meal for skill development.

CO4. Plan and develop different types of menu for food service establishment for global skill development.

PO – CO Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	3
CO2	3	3	2
CO3	3	2	1
CO4	3	2	1

Suggested Readings:

1. Green Erric (1986): Profitable Food And Beverage Management Operations, John Williams Company
2. JagmohanNegi: Managing Hotels and Restaurants, Authors Press, Delhi.
3. Peter F. Drucker: The Practice of Management, Allied Publishers limited.
4. SethiMohini (2007): Catering Management & Integrated Approach, Wiley Publication.
5. T. Ramaswamy: Principles of Management, Himalaya Publication.
6. Verghese Brian: Professional Food And Beverage Management, MacMillan India Ltd.
7. West B.B. & Wood L. (1988): Food Service in Institutions, John Wiley & Sons, New York.

Website sources:

1. Types of food services
https://www.tutorialspoint.com/food_and_beverage_services/food_and_beverage_services_types_of_service.htm
2. Styles of Catering Operations

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) I Year (I Semester)
MHSCFN-104T: Research Methods and Statistics - I

Objectives:

- To understand the significance and research methodology in Home Science research for skill development.
- To understand the types, tools and methods of research and develop the ability to construct data gathering instruments appropriate to the research design to provide employability & Skills.
- To understand and apply the appropriate technique for the measurement scale and design to provide employability & Skills.

UNIT I **(8 Sessions)**

Definition of research, Objectives of research, Scope of research in home science, Types of research, Anthropological and epidemiological research, Research process, Defining the research problem, Formulation of research hypotheses, Research design, Meaning, Important concepts relating to research design, Different research designs, Important experimental designs for skill development.

UNIT II **(8 Sessions)**

Literature search – Referencing, Abstracting, Computer search, Bibliography Measurement and scaling- Classification of measurement scales, Goodness of measurement scales, Scaling techniques to provide employability & Skills.

Questionnaire designing - Criteria for questionnaire designing, Questionnaire design procedure

Data collection - Collection of primary data, Collection of secondary data

UNIT III **(8 Sessions)**

Concept of statistics, Scope of statistics, Classification and tabulation of data - Introduction, meaning and objectives of classification, Types of classification, Formation of discrete frequency distribution, Formation of continuous frequency distribution, Tabulation of data, Parts of a table, General rules for tabulation, Types of tables, Diagrammatic and graphic presentation, Significance of diagrams and graphs, General rules for constructing diagrams and graphs, Types of diagrams, Graphs, Graphs of frequency distributions, Measure of central tendency – Mean, Median, Mode for skill development.

UNIT IV **(8 Sessions)**

Measures of dispersion – Range, Quartile deviation, Mean deviation, Standard deviation

Concept of normal distribution curve and probability, The meaning and importance of normal distribution, Measurement of normal probability distribution, Skewness, Kurtosis

Correlation analysis - Significance of the study of correlation -Types of correlation, Methods of studying correlation, Scatter diagram method , Graphic method, Karl Pearson's coefficient of correlation, Rank method, Method of least squares, Regression analysis, Types of regression models, Assumptions for a simple linear regression model Parameters of simple linear regression model, Methods to determine regression coefficients, Method of normal equations, Deviations method, Assumptions in multiple linear regression, Estimating parameters of multiple regression model, Least squares method to provide employability & Skills.

Course Outcomes:

- CO1. Explain research problems from the formulation of research hypothesis for global skill development.
- CO2. Understand the role of review of literature as a primary tool of research to provide national employability & Skills
- CO3. Apply statistical concepts of distribution of data in framing a research problem for global skill development
- CO4. Analyze the significance of the correlation and regression method to provide employability & Skills

PO – CO Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	3	1
CO3	3	2	1
CO4	3	3	1

Suggested Readings:

- Bernard Ostle. Statistics in Research.
- Best J. W. (1983): Research Education, Prentice Hall, New Delhi.
- Biostatistics, A Manual of Statistical Methods for use in Health, Nutrition and Anthropology, Editor-K VisweswaraRao, Jaypee
- Business statistics by J. K. Sharma, Pearson Education
- C.R. Kothari. Research Methodology (Methods & Techniques)
- Daryab Singh. Principles of Statistics, Atlantic Publishers & Distributors.
- Devdas R.P. (1971): Jamdnppi or Research Methodology, Shri Ramakrishna Mission Vidyalaya.
- Dody, J.T. (1967): An Introduction to Social Research, Appleton Center.
- Fredrick, Lamson, Whitney. The Elements of Research.
- Garret H.: Statistics in Education and Psychology.

Website sources:

- Research methodology, methods and techniques, CR Kothari
<http://www.modares.ac.ir/uploads/Agr.Oth.Lib.17.pdf>
- Research hypothesis – Slide share

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) I Year (II Semester)
MHSCFN-201T: Food Microbiology

Course Objectives:

- The course aims to provide theoretical and practical knowledge about the micro-organisms involved in the food spoilage, infections and intoxications for skill development.
- The course also enables to understand the concept of preservation and microbiological safety in various food operations to provide employability & skills.

UNIT - I

(4 Sessions)

Microorganisms of importance in food : Their primary sources in foods. Morphology; cultural characteristics and biochemical activities, Main characteristics of microbial growth for skill development

UNIT - II

(5 Sessions)

Factors affecting their growth in food. Intrinsic and Extrinsic parameters that affect microbial growth and their relevance to food spoilage and preservation.

Spoilage of different groups of food: Cereal and cereal products, vegetables and fruits, meat and meat products, eggs and poultry, milk and milk products, canned foods to provide employability & skills.

UNIT - III

(5 Sessions)

Food Preservation: Physical methods – Drying, cold storage, heat treatments, irradiation, Chemical preservatives and natural antimicrobial compounds, Biologically based preservation systems and probiotic bacteria for skill development

Microorganisms in food enzyme and technology: Food Fermentation – An introduction, Enzyme and food production, Micro-organisms as food.

UNIT - IV

(6 Sessions)

Food borne diseases: Foods involved, the disease, conditions necessary for an outbreak, prevention of outbreaks for – Food borne intoxication: Botulism and staphylococcal intoxication.

Food borne infections – Salmonellosis, Clostridium perfringens illness, Bacillus cereus gastroenteritis. Investigation of food borne disease outbreak. The HACCP system and food safety used in controlling microbiological hazards for skill development

Course Outcomes:

On successful completion of the course students will be able to:

- CO 1. Identify the important pathogens and spoilage microorganisms in foods and the conditions under which they grow for skill development.
- CO 2. Utilize laboratory techniques to identify microorganisms in food to provide national employability & skills.
- CO 3. Describe role and significance of microbial inactivation, adaptation and environmental factors on growth and response of microorganisms in various environments for global skill development.
- CO 4. Identify the conditions under which the important pathogens and spoilage microorganisms are commonly inactivated, killed or made harmless in foods for global skill development.

PO – CO Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	3	1
CO3	3	2	1
CO4	3	2	1

Suggested Readings:

1. Adams, M.R. & Moss M.G. (2008). Food Microbiology (1st ed.). New Delhi: New Age International (P) Ltd.
2. Atlas, M. R. (1995). Principles of Microbiology. Missouri, U.S.A.: Mosby – Year Book, Inc.
3. Banwart, G.(2004). Basic Food Microbiology (2nd ed). New Delhi: CBS Publishers.
4. Frazier, W.C. & Westhoff D. C. (2014) Food Microbiology. New York: Mc Graw Hill Inc.
5. Jay, J.M. (2005). Food Microbiology (6th ed.). Maryland: Aspen Publishers, Inc.
6. Pelczar, M.I. & Reid, R.D. (1998). Microbiology. New York: McGraw Hill Book Company.

Website Sources:

1. <http://www.fda.gov/Food/ScienceResearch/ResearchAreas/SafePracticesforFoodProcesses/default.htm>
2. Codex – Food hygiene www.fao.org/docrep/W4982E/w4982e09.html
3. www.europa.eu.int/comm/dg24/health/sc/scv/out26_en.html
4. CAC – Principles www.who.int/fsf/mbriskassess/pdf/draftpr.pdf
5. International commission on Microbiological Specifications for Foods (ICMSF) www.ICMSF.org
6. Ozfoodnet.org.au www.cdc.gov/foodnet

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) I Year (II Semester)
MHSCFN-251P: Food Microbiology (Practical)

Course Objectives:

- To familiarize with the techniques and methods used for cultivation, purification and identification of microbes to provide employability & skills.

Practical:

1. Cleaning and sterilization procedure of glassware for skill development.
2. Preparation of common laboratory media for skill development
3. Techniques of culturing on liquid and solid media to provide employability & skills
4. Staining of Bacteria: Gram's staining and spore staining
6. Bacteriological analysis of water and milk for skill development

Course Outcomes:

Student will be able to-

- CO 1. Understand the morphology and structural features of various micro-organisms for skill development.
- CO 2. Comprehend various techniques used for isolation, purification, identification and controlling the growth of micro-organisms for global skill development.
- CO 3. Assess the microbial safety of personal hygiene, water, milk and other food products to provide national employability & skills

PO – CO Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	2	1
CO3	3	3	1

Suggested Readings:

1. Pelezar, M.I. and Reid, R.D. (1933): Microbiology McGraw Hill Book Company, New York, 5th Edition.
2. Atlas, M. Ronald (1995) Principles of Microbiology, 1st Edition Mosby-year Book, Inc. Missouri, U.S.A.
3. Topley and Wilson's (1983) Principles of Bacteriology, Virology and Immunity, Edited by S.G. Wilson, A Miles and M.T. Parkar Vol. I : General Microbiology and Immunity II : Systematic Bacteriology. 7th Edition Edward Arnold Publishers.
4. Block, J.G. (1999): Microbiology Principles and Explorations, 4th Edition John Wiley and Sons Inc.
5. Frazier, W.C. (1988): Food Microbiology, McGraw Hill Inc. 4th Edition.
6. Jay, James, M.(2000) : Modern Food Microbiology, 6th Edition, Aspen Publishers Inc. Maryland.

Website Sources:

1. <http://www.fda.gov/Food/ScienceResearch/ResearchAreas/SafePracticesforFoodProcesses/default.htm>
2. Codex – Food hygiene www.fao.org/docrep/W4982E/w4982e09.html

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) I Year (II Semester)
MHSCFN-202T: Advanced Food Science-II

Objectives:

- To study scientific principles involved in food preparation and evaluation to provide employability & skill.
- To acquire knowledge regarding processing of foods for skill development.
- To understand the principles underlying newer techniques of food preservation and packaging to provide employability & skill.

UNIT I

(6 Sessions)

Pulses - Composition, methods of processing & cooking, effects of soaking, germination & fermentation, Toxic constituents for skill development.

Oilseeds and Nuts - Composition, oil extraction & by products, Toxic constituents

Fats & Oils - Composition of food fats, Modification of natural oils,-Hydrogenation, Properties of fats and oils, Deterioration of fats & antioxidants, fat substitutes for skill development.

UNIT II

(8 Sessions)

Milk & Milk Products - Composition of milk, Types of milk, Processing of milk - Pasteurization, Homogenization, Ultra Heat Treatment System (UHTS), Effect of heat & acid on milk protein, Composition & processing of curd, cheese, Paneer, Concentrated and dried milk products to provide employability & Skills.

Vegetables and fruits - Structure of vegetables & fruits, Color pigments & textural changes during ripening & processing, Recent advances in processing of vegetables & fruits, Browning reactions – enzymatic & non-enzymatic, prevention

UNIT III

(8 Sessions)

Eggs - Structure & composition, Quality evaluation of eggs, Changes during storage, Factors affecting coagulation of egg protein, Uses of eggs as binding, foaming & emulsifying agents, Methods of cooking eggs to provide employability & Skills.

Meat, Poultry and Fish - Structure & Composition, Ripening of meat, Tenderizing of meat, Changes on cooking meat by dry & moist heat methods, Curing & smoking of meat, Types of fish, Composition, Criteria for fish selection, Changes during heat treatment, Fish products – fish meal, fish protein concentrate, fish oils

UNIT IV

(6 Sessions)

Fermented Foods - Cereal based, pulse based, fruit- vegetable based

Beverages - Processing of Beverages – Tea, Coffee, Malted and Ready To Serve Beverage

Convenience foods -Types, techniques of instant mixes, extruded snacks

Packaging - Importance, Functions & types of packaging material knowledge for better employability in industry.

Course Outcomes:

On successful completion of the course students will be able to:

CO 1. Apply and incorporate the principles of Food Science in practical, real-world situations and problems for global skill development

CO 2. Explain the basic principles of sensory analysis and other analytical techniques associated with food to provide employability & global Skills.

CO 3. Impart awareness on the concept of ‘new food product development’ and current topics of importance to the Food industry to provide employability & global Skills

CO 4. Apply the various techniques in the quality evaluation of foods and demonstrate practical proficiency in food analysis laboratory knowledge for better employability in industry.

PO – CO Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	3	1
CO3	3	3	1
CO4	3	3	1

Suggested Readings:

1. Acharya, K.T.: A Historical Dictionary Of Indian Foods, Oxford Publishing Co.
2. Belitz, H.D. and Grosch W., (1999) : Food Chemistry, (2nded), Springer, New York
3. Belle Lowe (1963) : Experimental Cookery, John Wiley And Sons Inc., New York
4. Bennion, Marion And O. Hughes (1986) : Introductory Foods, Edi : MacMilan N. Y.
5. Girdharilal, G.S. Sidappa And G.L. Tandon (1986) : Preservation Of Fruits And Vegetables, (2nd Ed), New Delhi: Indian Council Of Agricultural Research.
6. Griswold, R.M. (1979) : The Experimental Study Of Food, Houghton Mifflim Boston.
7. Lee Frank A. (1975) : Basic Food Chemistry. - Westpot Connecticut: AVI Publishers.
8. Mahindru, S.N.: Food Additives, Characteristics, Detection And Estimation, Tata McGraw Hill Publishing Co. Ltd., New Delhi.

Website Sources:

1. <https://onlinecourses.nptel.ac.in/>
2. <https://www.wikipedia.org/>

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) I Year (II Semester)
MHSCFN-252P: Advanced Food Science-II (Practical)

Objectives:

- To study scientific principles involved in food preparation and evaluation to provide employability & skill.
- To acquire knowledge regarding processing of foods for skill development.
- To understand the principles underlying newer techniques of food preservation and packaging to provide employability & skill.

Practical:

1. Jams and Jellies: Pectin contents of fruits, role of acid, pectin and sugar in jam and jelly formation. Uses of gums as emulsifiers/stabilizers for skill development.

2. Fats and Oils: Flash point, melting point and smoking point. Role of fats and oil in cookery as : shortening agent, frying medium. Factors affecting fat absorption. Fat crystals. Plasticity of fat. Permanent and semi permanent emulsions for skill development

3. Milk and Milk Products: scalding, denaturation. Effect of acid, salt, alkali, sugar, heat, enzymes, polyphenols on milk, khoa, curd, paneer, cheese (ripened and unripened) to provide employability & skill.

4. Egg: Structure, assessing egg quality, use of egg in cookery-emulsions, air incorporation, thickening, binding, gelling. Method of egg cookery and effect of heat. Egg white foams and factors affecting foams for skill development.

5. Pulses: Effect of various cooking and processing methods on various characteristics, functional properties of pulses and their products for skill development

6. Meat and Poultry: Methods affecting tenderness of meat, effect of various methods of cooking and ingredients on colour, volume, texture, aroma, and water holding capacity for skill development.

7. Fish and Sea Foods: Effect of different cooking methods on various fish and seafoods.

8. Gelatin: Gelatin, gel strength and factors affecting gelatin. Ability to foam for skill development

9. Fruits and Vegetables: Pigments: effects of cooking, metal ions, pH. Effect of various cooking processes on different characteristics of vegetables. Prevention of enzymatic browning.

10. Beverages: Factors affecting quality of beverages for skill development

Course Outcomes:

On successful completion of the course students will be able to:

CO 1. Apply and incorporate the principles of Food Science in practical, real-world situations and problems for skill development.

CO 2. Explain the basic principles of sensory analysis and other analytical techniques associated with food to provide employability & Skills.

CO 3. Impart awareness on the concept of 'new food product development and current topics of importance to the Food industry to provide employability & Skills.

CO 4. Apply the various techniques in the quality evaluation of foods and demonstrate practical proficiency in food analysis laboratory knowledge for better national employability in industry.

PO – CO Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	3	1
CO3	3	3	1
CO4	3	3	1

Suggested Readings:

1. Manay S. N., (1987) : Foods, Facts And Principles, Wiley Eastern, New Delhi.
2. Meyer L.J. (1989) : Food Chemistry, CBS Publishers And Distributors, New Delhi.
3. Paul P.C. And Palmer H.H. (1972) : Food Theory And Application John Wiley And Sons, London
4. Peckham G.andFreeiand-Graves, G.H. (1979) : Foundation Of Food Preparation, Mac Millian Company
5. Potter, N. and Hotchkiss, J.H. (1996) : Food Science, Fifth ed., CBS Publishers and Distributors, New Delhi.

Website Sources:

1. <https://onlinecourses.nptel.ac.in/>
2. <https://www.wikipedia.org/>

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) I Year (II Semester)
MHSCFN-203T: Institutional Food Management-II

Objectives:

- To develop a knowledge base in key areas of Institutional Food Administration to provide employability & skills.
- To provide practical field level experience in Institutional Food Administration to provide employability & skills.
- To impart necessary expertise to function as a Food Service Manager for better skilling of entrepreneurship.
- To equip individuals to start their own food service unit leading to entrepreneurship.
- To develop critical abilities and provide basic grounding in research techniques for skill development.

UNIT I

(5 Sessions)

Food Management - Importance of Menu Planning in Food Service Organization, Types of menu, Principles of Menu Planning, Writing the menu, Construction and Evaluation of Menu

Food Production System - Standardization of recipe, Principles involved in construction of recipes in large Scale Cooking, Utilization of left over foods for better skilling of entrepreneurship.

UNIT II

(5 Sessions)

Food Service -Types of food services in a Food Service Establishment, Types of food service in a Restaurant- silver service, plate service, cafeteria service, buffet service, Centralized and Decentralized system of service to provide employability & skills.

UNIT III

(5 Sessions)

Personnel Management - Approaches to Staff Management for skill development

Staff Recruitment - Sources of recruitment, Selection, Induction, Staff Training, Supervision, Performance Appraisal, Motivation, Wages and other compensations, Labor laws and other legal aspects

UNIT IV

(8 Sessions)

Cost Accounting - Budget, Types of Budget, Purchase Records, Receiving Records, Storage Records, Production Records, Service Records, Income and Expenditure Record

Cost Control - Factors affecting cost control, Importance of Costing, Components of Costing, Breakeven Analysis, Determining Selling Price of Food, Checklist for Cost Control for skill development

Course Outcomes:

On successful completion of the course students will be able to:

- CO 1. Describe the food service management in different setting for better skilling of local entrepreneurship.
- CO 2. Estimate the various types of food service in different situation to provide employability & skills.
- CO 3. Estimate the cost of any meal for global skill development.
- CO 4. Plan and develop different types of menu for food service establishment for global skill development

PO – CO Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	3
CO2	3	3	2
CO3	3	2	1
CO4	3	2	1

Suggested Readings:

1. Green Erric (1986): Profitable Food and Beverage Management Operations, John Williams Company
2. JagmohanNegi: Managing Hotels And Restaurants, Authors Press, Delhi.
3. Peter F. Drucker: The Practice of Management, Allied Publishers limited.
4. SethiMohini (2007): Catering Management & Integrated Approach, Wiley Publication.
5. T. Ramaswamy: Principles of Management, Himalaya Publication.
6. Verghese Brian: Professional Food And Beverage Management, MacMillan India Ltd.
7. West B.B. Wood L. (1988): Food Service in Institutions, John Wiley & Sons, New York.

Website sources:

1. Types of food services
https://www.tutorialspoint.com/food_and_beverage_services/food_and_beverage_services_types_of_service.htm
2. Styles of Catering Operations

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) I Year (II Semester)
MHSCFN-204T: Research Methods and Statistics II

Objectives:

- To understand the significance and research methodology in Home Science research for skill development.
- To understand the types, tools and methods of research and develop the ability to construct data gathering instruments appropriate to the research design to provide employability & skills.
- To understand and apply the appropriate technique for the measurement scale and design to provide employability & skills.

UNIT I

(8 Sessions)

Sampling considerations – Sampling concepts, Sampling v/s non-sampling error, Probability sampling design, Non-probability sampling design, Determination of sample size
Estimation and confidence intervals – Point estimation, Interval estimation
Hypothesis testing – Rationale for hypothesis testing – A general procedure for hypothesis testing, One-tailed and two-tailed tests, Errors in hypothesis testing for skill development.

UNIT II

(8 Sessions)

Students t' test for small samples for –Testing differences in proportions ,Testing differences in means
Large sample test (C. R. Test) for testing significance of difference between mean of two groups
Analysis of variance – One way ANOVA, Two way ANOVA to provide employability & skills.

UNIT III

(8 Sessions)

Chi-square test – Chi-square distribution, Chi-square test statistic, Application of chi-square test
Equal probability type , Normal distribution type, 2 X 2 contingency tables type, Chi-square test of independence, Participatory rapid assessment, Participatory learning assessment for skill development.

UNIT IV

(6 Sessions)

The writing process – Getting started, Use outline as a starting device, Drafting, Reflecting , Re-reading, Checking organization, Checking headings, Checking content, Checking clarity, Checking grammar, Parts of dissertation/Research report/article – Abstract, Introduction, Review of literature, Materials and methods, Results and discussion , Summary and conclusion, Bibliography, Recommendation, Computer applications in data analysis - Use of MS-Office for research, Graphic representation, Use of SPSS for data analysis to provide employability & skills.

Course Outcomes:

On successful completion of the course students will be able to:

- CO 1. Explain research problems from the formulation of research hypothesis for global skill development.
- CO 2. Explain the significance of research methodology to provide national employability & skills.
- CO 3. Distinguish between different types of tools and methods of research for global skill development.
- CO 4. Analyze a research problem and design research proposals and prepare research report to provide employability & global skills.

PO – CO Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	3	1
CO3	3	2	1
CO4	3	3	1

Suggested Readings:

1. Bernard Ostle Statistics in Research.
2. Best J. W. (1983) : Research Education, Prentice Hall, New Delhi..
3. Biostatistics, A Manual of Statistical Methods for use in Health, Nutrition and Anthropology, Editor-K VisweswaraRao, Jaypee
4. Business statistics by J. K. Sharma, Pearson Education
5. C.R. Kothari : Research Methodology (Methods & Techniques)
6. Daryab Singh Principles of Statistics, Atlantic Publishers & Distributors.
7. Devdas R.P. (197 1): JamdnppiOf Research Methodology, Shri Ramakrishna Mission Vidyayala.
8. Dody, J. T. (1967): An Introduction To Social Research, AppletonCenter.
9. Fredrick, Lamson, Whitney: The Elements of Research.
10. Garrett, H. : Statistics In Education And Psychology.
11. Good, Carter, Scales and Douglas: Methods of Research.
12. Gupta S.P. (1970): Statistical Methods, S. Chand Company, New Delhi.

Website sources:

1. Research methodology, methods and techniques, CR Kothari
<http://www.modares.ac.ir/uploads/Agr.Oth.Lib.17.pdf>
2. Research hypothesis – Slide share

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) II Year (III Semester)
MHSCFN-301T: Clinical & Therapeutic Nutrition –I

Objectives:

The course will enable students to:

- Understand the role of dietitian/nutritionist in preventive, promotive & curative health care to provide employability & skills.
- Understand the etiology, physiologic and metabolic anomalies of acute and chronic diseases and patient need for skill development.
- Know the effect of various diseases on nutritional status and nutritional and dietary requirements for skill development
- Be able to recommend and provide appropriate nutritional care for prevention/and treatment of the various diseases for better skilling of entrepreneurship.
- Provide practical laboratory training in the preparation of special diets to provide employability & skills.

UNIT I

(8 Sessions)

Definitions, Classifications of Dietitian in Health Care – Dietetics – the Science & Art of human nutrition care, Role & responsibilities of dietitian in health care, Adaptation of therapeutic diets, Therapeutic diets – Types of dietary adaptations for therapeutic needs, Normal nutrition – a base of therapeutic diet, Constructing therapeutic diets, Routine hospital diets, Normal / General diets, Liquid diets, Soft diets, Bland diets for skill development

Newer Trends in Delivery of Nutritional Care and Dietary Counseling- Nutritional care plan – Development of a plan, Implementation of nutritional care, Evaluation of nutritional care, Nutritional care record, Care Management Strategies – Care management, Patient- focused care, Counseling for change – Stages of change, Activities that facilitate change, Intervention model, Resistance behaviors & potential strategies to modify them

Diet, Nutrient and Drug Interaction – Effect of drugs on ingestion, digestion, absorption and metabolism of nutrients, Effect of foods, nutrients and nutritional status on drug dosage and efficacy to provide employability & skills.

Nutritional Care in Weight Management – Weight imbalance – Prevalence, Components of body weight, Guidelines for calculating ideal body weight

Obesity– Etiology, Classification, Energy balance, Metabolic aberrations & clinical manifestations, Consequences/risk factors, Dietary modifications, Lifestyle modifications, Pharmaceutical management, Surgical management, Preventive aspects

Underweight – Etiology, Metabolic aberrations & clinical manifestations, Dietary management

UNIT II

(8 Sessions)

Nutrition in Eating Disorders – Anorexia Nervosa & Bulimia Nervosa – Diagnostic criteria, Epidemiology, Pathophysiological consequences of eating disorders, Clinical characteristics & medical complications, Psychological management, Nutritional assessment, Nutrition management, Nutrition education to provide employability & skills.

Nutrition Therapy for Upper Gastro Intestinal Tract Disorders – Etiology, signs & symptoms, complications, Nutritional care & medical management for upper gastro intestinal tract disorders:

Disorders of Stomach – Indigestion/Dyspepsia, Gastritis, Peptic Ulcer and Duodenal Ulcer, Dumping Syndrome

UNIT III**(8 Sessions)****Nutritional Therapy for Liver, Biliary System and Exocrine Pancreas Disorders to provide employability & skills.****Liver Diseases** – Physiology and functions of the liver, Liver function tests, Diseases of the liver- Hepatitis – types, etiology, symptoms, complications, Cirrhosis – types, etiology, symptoms, complications, metabolic consequences of alcohol consumption, Hepatic Coma – stages, etiology, symptoms & complications

Medical nutritional management of liver diseases

Gall Bladder Diseases – Physiology and functions of Gall Bladder, Gall bladder function tests, Disorders of Gall Bladder: Cholelithiasis, Cholecystitis, Acute Cholangitis, Cholestasis, Medical nutritional management of gall bladder diseases**Pancreatic Disorders**

Physiology and functions of exocrine Pancreas, Pancreatic function tests, Pancreatitis (Acute & Chronic), Medical nutritional management of pancreatic disorders

UNIT IV**(8 Sessions)****Hypertension and Coronary Heart Diseases****Hypertension** – Definition, Classification, Pathophysiology, Causes, Symptoms & Complications, Management – Dietary management, Medication, Lifestyle modification **Coronary Heart Diseases (CHD)** – Common Disorders of CHD – Dyslipidemias, Atherosclerosis, Angina Pectoris, Myocardial Infarction (MI), Congestive Cardiac Failure (CCF), Rheumatic Heart for skill development.**Course Outcomes:**

The student will be able to

CO 1. Understand the importance of nutritional assessment in the care of patients to provide national employability & skills.

CO 2. Gain knowledge about causative factors and metabolic changes in various diseases/disorders and the associated principles of diet therapy to provide national employability & global skills.

CO 3. Learn the principles of dietary counseling to provide employability & global skills.

CO 4. Comprehend the rationale of prevention of various diseases/disorders for global skill development

PO – CO Mapping**(Please write 3, 2, 1 wherever required)****(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

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

CO- Curriculum Enrichment Mapping**(Please write 3, 2, 1 wherever required)****(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	1
CO2	3	3	1
CO3	3	3	1
CO4	3	1	1

Suggested Readings:

1. Antia F.P. And Philip Abraham (2001) Clinical Nutrition and Dietetics, Oxford Publishing Company.
2. B. Srilakshmi, (2007) : Dietetics, published by K.K. Gupta For Newage International Pvt. Ltd. New Delhi.
3. Benion M. : Clinical Nutrition, Harper And Row Publishing M.Y.
4. Gopalan C., Ram Sastri B.V. And BalSubramaniam S.C., (2006) Nutritive Value of Indian Foods, Hyderabad, National Institute of Nutrition, Indian Council of Medical Research.
5. Mahan L.K., Sylvia Escott-Stump(2000) : Krause's Food Nutrition and Diet Therapy 10th Edition, W.B. Saunders Company London.
6. Passmore P. And M.A. East Wood : Human Nutrition And Dietetics, Churchill Living Stone.
7. Raheena M. Begum (1989) : A Text Book of Foods Nutrition And Dietetics, Wiley Eastern Ltd., New Delhi.
8. Robinson Ch., M.B. Lawlea, W.L., Chenoweth, And A.E., Carwick : Normal And Therapeutic Nutrition, Macmillan Publishing Company.
9. Sue Rodwell Williams, (1993) : Nutrition, Diet Therapy, (7th Ed) : W.B. Saunders Company London.
10. WohlShils And Goodheart : Modern Nutrition In Health And Disease, McLaren And Ubrman, Philadelphia.

Website sources:

1. Burden of Disease in India
2. [https://www.who.int/macrohealth/action/NCMH_Burden%20of%20disease_\(29%20Sep%202005\).pdf](https://www.who.int/macrohealth/action/NCMH_Burden%20of%20disease_(29%20Sep%202005).pdf)
3. National family health survey -4 http://rchiips.org/nfhs/factsheet_nfhs-4.shtml
4. Dietary Guidelines for Indians
<http://ninindia.org/DietaryGuidelinesforNINwebsite.pdf>
5. ICMR guidelines for management of type 2 diabetes 2018

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) II Year (III Semester)
MHSCFN-351P: Clinical & Therapeutic Nutrition – I (Practical)

Objectives:

The course will enable students to:

- Understand the role of dietitian/nutritionist in preventive, promotive & curative health care to provide employability & skills.
- Understand the etiology, physiologic and metabolic anomalies of acute and chronic diseases and patient needs for skill development.
- Know the effect of various diseases on nutritional status and nutritional and dietary requirements for skill development.

Practical:

1. Standards for hospital diets : Food exchange list for use in special diets using common Indian foods., Interpretation of diets in common household measures, standardization of measures, Determination of raw and cooked weights in selected breakfast, lunch, snacks and dinner recipes, calculation of exchanges in the recipes to provide employability & skills

2. Market survey of commercial nutritional supplements and nutritional support substrates
Commonly used tests for diagnosis of various diseases - system-wise- Interpretation of patient data and diagnostic tests and drawing up of patient diet prescription using a case study approach. Follow up – acceptability of diet prescription, compliance, discharge diet plan to provide employability & skills.

3. Visit to hospital to observe the following: Tray service, Trolley service, Centralized food service, Decentralized food service for skill development.

Course Outcomes:

The student will be able to

- CO 1. Understand the importance of nutritional assessment in the care of patients to provide national employability & skills.
- CO 2. Gain knowledge about causative factors and metabolic changes in various diseases/disorders and the associated principles of diet therapy to provide employability & global skills
- CO 3. Learn the principles of dietary counseling to provide employability & skills.
- CO 4. Comprehend the rationale of prevention of various diseases/disorders for global skill development.

PO – CO Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	1
CO2	3	3	1
CO3	3	3	1
CO4	3	1	1

Suggested Readings:

1. Antia F.P. And Philip Abraham (2001) Clinical Nutrition and Dietetics, Oxford Publishing Company.
2. B. Srilakshmi, (2007) : Dietetics, published by K.K. Gupta For Newage International Pvt. Ltd. New Delhi.
3. Benion M. : Clinical Nutrition, Harper And Row Publishing M.Y.
4. Gopalan C., Ram Sastri B.V. And BalSubramaniam S.C., (2006) Nutritive Value of Indian Foods, Hyderabad, National Institute of Nutrition, Indian Council of Medical Research.
5. Mahan L.K., Sylvia Escott-Stump(2000) : Krause’s Food Nutrition and Diet Therapy 10th Edition, W.B. Saunders Company London.
6. Passmore P. And M.A. East Wood : Human Nutrition And Dietetics, Churchill Living Stone.
7. Raheena M. Begum (1989) : A Text Book of Foods Nutrition And Dietetics, Wiley Eastern Ltd., New Delhi.

Website sources:

1. Burden of Disease in India
2. [https://www.who.int/macrohealth/action/NCMH_Burden%20of%20disease_\(29%20Sep%202005\).pdf](https://www.who.int/macrohealth/action/NCMH_Burden%20of%20disease_(29%20Sep%202005).pdf)
3. National family health survey -4 http://rchiips.org/nfhs/factsheet_nfhs-4.shtml
4. Dietary Guidelines for Indians
<http://ninindia.org/DietaryGuidelinesforNINwebsite.pdf>
5. ICMR guidelines for management of type 2 diabetes 2018

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) II Year (III Semester)
MHSCFN-302T: Food Product – Development Safety and Quality Control

Objectives:

- Understand how food- borne illness occur for skill development.
- Know about National and International food standards and their role in ensuring food quality and safety to provide employability & skills.
- Understand the importance of food safety management systems to provide employability & skills.

UNIT-I **(6 Sessions)**

Introduction to food safety: Definition, food safety issues, factors affecting food safety, importance of safe foods. Shelf life of Food Products: factors affecting shelf life and methods to check the shelf life for skill development

UNIT-II **(8 Sessions)**

Food additives and contaminants: Meaning, various kinds of additives- food colour. Preservatives, antioxidants, antimicrobial substances, artificial sweeteners, flavouring, emulsifying, stabilizing agents, Food contaminants of natural origin- seafood toxins, toxic aminoacids and lathyrism, goitrogens, Haemagglutinins, phytates, cyanogenic glycosides, indirect additives, pesticides, contaminants and adulterants, pesticide residues, metallic contaminants, radionuclides, adulterants. Recent concerns on food safety: genetically modified foods to provide employability & skills.

UNIT-III **(6 Sessions)**

Food processing: types of processing methods, effect of processing treatments – processing of application of heat, processing by removal of heat, ambient temperature processing. Minimal processing for skill development.

UNIT-IV **(8 Sessions)**

Food laws and regulations: national food legislation, other food legislations/ authorities and their role- essential commodities act, 1955, standard of weight and measures act, 1976, export(quality control and inspection) act, 1963, voluntary based product certifications (ISI mark of BIS and agmark), international organization and agreements-food and agricultural organization (FAO), world health organization(WHO), codex alimentarius, codex India, joint FAO/WHO expert committee on food additives(JECFA), world trade organization(WTO), sanitary and phytosanitary measures(SPS) and technical barriers to trade(TBT), international organization for standardization(ISO) to provide employability & skills.

UNIT-V **(8 Sessions)**

Food safety and quality management systems: general principle of food safety risk management, hazard analysis critical control point system (HACCP), quality management system.

Food Packaging: Need, material used and labeling Knowledge for better employability in industry.

Course Outcomes:

On successful completion of the course students will be able to:

- CO 1. Understand microbial safety in various food operations for global skill development.
- CO 2. Understand the nature of microorganism involved in food spoilage, food infections and intoxications to provide national employability & skills.
- CO 3. Analyze and evaluate novel food processing methods including non thermal food processing techniques using pressure for global skill development
- CO 4. Familiarize about the food laws and regulations to provide national employability & skills.
- CO 5. Critique environmental issues and quality control associated with food packaging Knowledge for better national employability in industry.

PO – CO Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	3	3	2	3	1	2	2	2
CO2	3	3	3	1	3	1	1	2	3	2	2	2
CO3	3	1	3	2	3	3	3	3	3	1	1	3
CO4	3	1	3	3	3	2	2	2	1	2	3	2
CO5	2	3	1	1	2	1	1	3	1	1	2	3

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	3	1
CO3	3	2	1
CO4	3	3	1
CO 5	3	3	1

Suggested Readings

1. WHO, 1998 world health report life in the 21 st centuries. Report of the director general who Geneva.
2. FAO food and nutrition paper manual of food quality control – part 14/1 (1979), to 14/8 (1986) FAO of the United Nations.
3. Curricula on food safety. Directorate general of health services. Ministry of health and family welfare. Government of India. NirmanBhavan, New Delhi.
4. Graham, H.D. 1980: the safety of foods, AVI publishing company Inc. Westport.
5. Early, R. (2006) Guide to Quality Management Systems for the Food Industry, Blackie, Academic and professional, London.
6. Gould, W.A and Gould, R.W. (2005) Total Quality Assurance for the Food Industries, CTI Publications Inc. Baltimore.

Website sources:

1. Sensory evaluation in food industry
2. http://eta.bibl.u-szeged.hu/731/1/sensory_evaluation_in_food_teljes.pdf
3. Quality Control A Model Program for the Food Industry
4. <https://athenaeum.libs.uga.edu/bitstream/handle/10724/12251/B997.pdf?sequence=1>
5. 3. Food Quality Assurance

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) II Year (III Semester)
MHSCFN-352P: Food Product – Development Safety and Quality Control (Practical)

Objectives:

- Understand how food- borne illness occur for skill development.
- Know about National and International food standards and their role in ensuring food quality and safety to provide employability & skills.
- Understand the importance of food safety management systems to provide employability & skills.

Practical:

1. Assessment of purity and quality using appropriate standard tests for following

- Milk and milk products
- Fat and oils
- Water
- Ice cream, fruit juices
- Cercal and cereal products
- Spices, Tea, Coffee
- Canned, dehydrated and frozen products for skill development

2. Microbiological tests to assess the quality and contamination of common food products to provide employability & skills.

Course Outcomes:

On successful completion of the course students will be able to:

- CO 1. Design and develop new food products for human consumption to provide employability & global skills.
- CO 2. Evaluate sensory and nutritional attributes of new product to provide national employability & skills.
- CO 3. Appreciate the effect of processing upon the nutritional properties of foodstuffs for global skill development.

PO – CO Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	1
CO2	3	3	1
CO3	3	2	1

Suggested Readings:

1. WHO, 1998 world health report life in the 21st centuries. Report of the director general who Geneva.
2. FAO food and nutrition paper manual of food quality control – part 14/1 (1979), to 14/8 (1986) FAO of the United Nations.
3. Curricula on food safety. Directorate general of health services. Ministry of health and family welfare. Government of India. Nirman Bhavan, New Delhi.
4. Early, R. (2006) Guide to Quality Management Systems for the Food Industry, Blackie, Academic and professional, London.
5. Gould, W.A and Gould, R.W. (2005) Total Quality Assurance for the Food Industries, CTI Publications Inc. Baltimore.
6. Pomeroy, Y. and MeLoari, C.E. (2008) Food Analysis: Theory and Practice, CBS publishers and Distributor, New Delhi

Website sources:

1. Sensory evaluation in food industry
2. http://eta.bibl.u-szeged.hu/731/1/sensory_evaluation_in_food_teljes.pdf
3. Quality Control A Model Program for the Food Industry
4. <https://athenaeum.libs.uga.edu/bitstream/handle/10724/12251/B997.pdf?sequence=1>
5. Food Quality Assurance

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) II Year (III Semester)
MHSCFN-303T (A): Advanced Nutrition – I

Objectives:

This course is designed to:

- Provide in-depth knowledge of the physiological and metabolic role of various nutrients and their interaction in human nutrition for skill development.
- Enable students to understand the basis of human nutritional requirements and recommendations through the life cycle for skill development
- Enable students to understand the pharmacological actions of nutrients and their implications for skill development.
- Nutritional problems / nutrition related diseases prevalent among the affluent and the less privileged groups with reference to their incidence, etiology and public health significance for skill development
- Biochemical and clinical manifestations, preventive and therapeutic measures of the nutritional problems to provide employability & skills.
- Familiarize students with the recent advances in nutrition for skill development.

UNIT I

(8 Sessions)

Body Composition - Levels of body composition, Body composition measurement techniques, Compartmental Models of body composition, Direct methods & Indirect methods - Circumference measurements, Skinfold thickness, Anthropometric indices, Body volume determination/Underwater weighting (UWW), Isotope dilution method, Bioelectrical impedance analysis (BIA), Dual energy X-ray absorptiometry, (DEXA), Near-infrared interactance, Total body potassium (TBK), Total body protein (TBP), Air displacement plethysmography (ADP), Total body electrical conductivity (TOBEC), Total body electrical conductivity, Imaging techniques: Magnetic resonance imaging (MRI), Computed tomography (CT scan), Ultrasound measurements, Significance of body composition measurement for skill development.

UNIT II

(8 Sessions)

Energy Metabolism- Basic Concept of Energy, Regulation of food intake, Factors influencing food intake, Energy Intake - Energy from glucose, protein and fat, Components of energy requirement, Factors affecting energy expenditure & requirement, Methods of estimation of energy expenditure & requirement, Energy requirements & dietary energy recommendations - Energy requirements in infants, children, adolescents, adults, pregnancy, lactation, elderly, physically active group, disease & trauma, Energy imbalance - Consequences of energy imbalance. Indices for measurement of energy imbalance for skill development

UNIT III

(8 Sessions)

Carbohydrates – Classification, Functions, Sources, Digestive fate of dietary carbohydrates, Absorption and metabolic utilization of carbohydrates, Regulation of blood glucose concentration, Dietary management of blood glucose concentration- Glycemic index, Fructose, Non glycaemic carbohydrates - Dietary fiber, Resistance starch, Fructo oligosaccharides to provide employability & skills

UNIT IV

(8 Sessions)

Protein- Classification - proteins, amino acids, Functions, Sources, Nutritional significance of dietary amino acids, Digestion, absorption and transport, Protein synthesis, degradation and turnover, Factors influencing protein & amino acid requirements, Protein and amino acid requirements for various age and physiological groups, Concept of protein quality, methods of measuring protein quality, Improvement of protein quality of diets to provide employability & skills.

Course Outcomes:

After doing this course the student will be able to:

- CO 1. Critically evaluate and derive requirements for specific macronutrients for global skill development.
 CO 2. Understand critical periods in growth and development and impact of malnutrition for skill development.
 CO 3. Assess the nutritional status of children and adults to provide national employability & skills
 CO 4. Implications of poor dietary and lifestyle practice to provide national employability & skills

PO – CO Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	2	1
CO3	3	3	1
CO4	3	3	1

Suggested Readings:

1. Baeurle, P.A. (ed) (1994) : Inducible Gene Expression. Part 1, Environmental stresses and Nutrients, Boston, Birkhauser.
2. Berdanier, C.D. and Haargrove., J.L. (ed) (1996) : Nutrients and Gene Expression, Clinical Aspects, Boca Raton, FL CRC Press.
3. Bogert, R.j.; Briggs, G.H. and Calloway, D.H. (1973) : Nutrition and Physical Fitness, Saunders and Company
4. Chandra, R.K. (ed) (1992): Nutrition and Immunology, ARTS Biomedical St. John's Newfoundland.
5. Chaney, M. S. - Rose, M.L. & Wisehi J.C. Nutrition (1979): Houghton Mifflin, Boston.
6. Hawk P.B., Oser B.L. and Summerson, (1972) : W.H. Practical Physiological Chemistry, Ed. Bernard Oser, Tata McGraw Hill.

Website sources:

1. Nutrient Requirements and Recommended Dietary Allowances for Indian
 A Report of expert group of ICMR 2009

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) II Year (III Semester)
MHSCFN-303T (B): Nutrition and Weight Management

Objectives:

This course is designed to:

- Provide in-depth knowledge of the physiological and metabolic role of various nutrients and their interaction in human nutrition during weight management for skill development.
- Enable students to understand the basis of human nutritional requirements and recommendations during weight management for skill development.
- Enable students to understand the pharmacological & surgical interventions during obesity to provide employability & skills.
- Understand the concept of adequate diet & the importance of meal planning in obesity to provide employability & skills.

UNIT I

(8 Sessions)

Components of Body Weight – Adipocytes, Types & fat cell development, hypertrophy & hyperplasia, Fat storage & transport, Hunger & Satiety, Control of food intake & regulation of body weight, Energy homeostasis, Energy expenditure, energy intake, energy balance & weight control (positive energy balance & weight gain, negative energy balance & weight loss), Factors affecting energy expenditure, Regulation of body weight, Short term & long term regulation, Factors regulating food/energy intake & body weight for skill development.

UNIT II

(8 Sessions)

Obesity - Prevalence of obesity, Definition, classification & etiology of obesity, Assessment of obesity, Diagnostic procedures, Complications of obesity, Metabolic syndrome, diabetes mellitus, cardiovascular diseases, musculoskeletal consequences etc., Nutritional management of obesity, Determination of energy needs, Rate & extent of weight loss, Dietary modifications-energy restricted diets: moderately energy deficit diet, low & very low energy diets, fasting, low carbohydrate & low fat diets, high fiber diets, fad diets & practices, intake of protein, vitamins, minerals & fluid intake in obesity, Childhood & adolescence obesity to provide employability & skills

UNIT III

(8 Sessions)

Underweight - Definition, classification & causes of underweight, Assessment of underweight, Complications of underweight, Nutritional management of underweight to provide employability & skills

Eating Disorders - Anorexia Nervosa, Definition, diagnosis, clinical characteristics & complications of anorexia nervosa, Nutritional management of anorexia nervosa, Bulimia Nervosa - Definition, diagnosis, clinical characteristics & complications of bulimia nervosa, Nutritional management of bulimia nervosa, Psychological management of anorexia nervosa & bulimia nervosa to provide employability & skills

UNIT IV

(8 Sessions)

Psychological viewpoints/aspects of obesity - Eating behavioural control, Prevention of overweight & obesity - Lifestyle modification, Diet counseling & nutrition education, Weight management in children, Maintenance of reduced body weight to provide employability & skills

Exercise & weight loss - Effect of exercise on obesity & body fat distribution, Exercise & use of body fuels, Types of exercise for weight reduction, Fat utilization & fat mobilization, Exercise regime for weight loss & weight maintenance

Course Outcomes:

After doing this course the student will be able to:

- CO 1. Improved physical health for global skill development
- CO 2. Understand important principals of nutrition to provide national employability & skills
- CO 3. Understand food choices it's affect on the quality of their life to provide employability & skills
- CO 4. Learn the skills and gain a confidence for participating in the development of fitness levels and overall health to provide national employability & skills

PO – CO Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	1	1
CO2	3	3	1
CO3	3	3	1
CO4	3	3	1

Suggested Readings-

1. Bogert, R.j.; Briggs, G.H. and Calloway, D.H. (1973) : Nutrition and Physical Fitness, Saunders and Company.
2. Indian Council of Medical Research Nutrient Requirements and Recommended Dietary Allowances for India, A Report of the Expert Group of the Indian Council of Medical Research, New Delhi; ICMR.
3. Kathleen Mahan and Sylvia Escort – Stump (2000): Food, Nutrition & Diet Therapy 11th Edition, W.B. Saunder's Company London.
4. Mahtab S. Bamji, N. Prahlada Rao, Vinodini Reddy (2005): Text Book of Human Nutrition, Oxford & IBM Publishing Co. Pvt. Ltd., New Delhi.
5. Michael J. Gibney, Hester V Vorster and Frans J Kok (2003) Introduction to Human Nutrition. Blackwell publishing Oxford, U.K.
6. NandePrajakta. J. and ValiSabiha A. (2010). Fitness Evaluation Tests for Competitive Sports, 1st Edition, Himalaya Publishing House, India.
7. Prasad, H.S. (1976) : Trace Elements in Human Health and Disease, Nutrition Foundation Mongraph Series, Academic Press Inc.
8. Roach Benyan (2003) Metabolism and Nutrition. Elsevier Science Ltd. Philadelphia. U.S.A.

Website sources:

1. History, Nutraceuticals, Mechanism, products and application
2. <https://www.slideshare.net/drswaroopsoumya/prebiotics-and-probiotics-40275016>
3. Different kinds of probiotics, sources and side effects
<https://www.slideshare.net/151212345/prebiotic-and-probiotic>
4. Inborn errors of metabolism

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) II Year (III Semester)
MHSCFN-304T (A): Program Planning in Public Health Nutrition

Course Objectives:

- This course will make the students familiar with the process of planning and management of public health nutrition programmes. It will help them understand the concept of monitoring of programmes and nutritional surveillance to provide employability & skills.
- The students will also learn about nutrition in emergency and disaster situations for skill development.

UNIT I

(8 Sessions)

Programme planning and management in public health nutrition- Introduction to Management Principles, Basic principles and models of programme planning, Planning process in public health nutrition - community needs assessment, setting goals and objectives, selecting indicators, selecting interventions, planning for programme implementation and resources, planning for programme monitoring and evaluation, planning for programme termination, stakeholder participation in programme management, Planning at micro and macro level to provide employability & skills

UNIT II

(8 Sessions)

Programme monitoring and evaluation - Definition, significance and purpose of monitoring food/nutrition programmes, Identification and selection of indicators for monitoring, data collection and analysis system (e.g. MIS), Definition, significance and purpose of evaluation of food/nutrition programmes, Principles of evaluation, types, models and steps of evaluation, Identification and selection of indicators for evaluation Strategies for data collection - qualitative and quantitative to provide employability & skills

UNIT III

(8 Sessions)

Nutrition Surveillance Objectives, initial assessment indicators for use in nutrition surveillance, Nutritional surveillance for programme planning: Triple A approach, Current programme monitoring systems in India for skill development.

UNIT IV

(8 Sessions)

Nutrition in emergencies and disasters Natural and manmade disasters resulting in emergency situations, Nutritional problems in emergencies in vulnerable groups, Macro / micronutrient deficiencies, Infections, Assessment and surveillance of affected population groups – clinical, anthropometric and dietary, Nutritional relief and rehabilitation – assessment of food needs, food distribution strategies, mass/supplementary feeding, hygiene and sanitation, evaluation of feeding programmes, Public nutrition approaches to tackle nutritional problems in emergencies for skill development.

Course Outcomes:

The students will:

- CO 1. Become familiar with the process of planning and management of public health nutrition programmes to provide national employability & skills
- CO 2. Develop an understanding of the concept of nutrition monitoring and nutrition surveillance to provide employability & skills
- CO 3. Understand Nutritional surveillance for programme planning for skill development.
- CO 4. Get acquainted with the nutritional problems during emergencies/ disasters and the Strategies to tackle them for global skill development

PO – CO Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	1
CO2	3	3	1
CO3	3	2	1
CO4	3	2	1

Suggested Readings:

1. Boyle M.A. (2016). Community Nutrition in Action: An Entrepreneurial Approach. 7th Edition. Brooks Cole.
2. Edelstein S. (2010) Nutrition in Public Health: A handbook for developing programmes and services. Third Edition. Jones and Bartlett Learning.
3. FAO. (1983) Selecting Interventions for Nutrition Improvement. A Manual. Nutrition in Agriculture.No. 3.
4. Gibney M.J., Margetts, B.M., Kearney, J.M., Arab, L. (Eds) (2004) Public Health Nutrition.NS Blackwell Publishing.
5. Vir, S.C. (Ed.). (2011). Public Health Nutrition in Developing Countries. Part 2. Woodhead Publishing India.
6. WHO. (2000). The management of nutrition in major emergencies.

Website sources:

1. Carbohydrate loading, fueling exercise, Pre and post workout meal, hydration
www.slideshare.net/MUSWellness/sports-exercise-nutrition
2. Benefits, Principles, Pre and post workout meals
<https://www.slideshare.net/fitnesslex/sports-nutrition-38663048>
3. Nutrients in sports nutrition

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) II Year (III Semester)
MHSCFN-304T (B): Nutrition Communication and Diet Counselling

Course Objectives:

- To equip students to understand the influence of counseling on disease management and identify components of counselling skills for development.
- To provide skills of counselling for specific disease conditions to provide employability & skills.

UNIT I (8 Sessions)

Basics of Communication - Meaning of Communication, Forms of communication: Verbal and Non-verbal Communication, Communication methods, Traditional, Current and Emerging methods/tools of communication, Characteristics of effective communication, Skills and attributes of a communicator, Approaches in communication, Barriers to effective communication skills for development

UNIT II (6 Sessions)

Nutrition Counselling - Concept and importance of counseling in the nutrition care process, Understanding dietary patterns and food choices and their impact on counseling, Behaviour Change Communication and Models for behaviour change, Counseling strategies, Factors to be considered for counseling, Conventional and non-conventional tools in counseling to provide employability & skills

UNIT III (6 Sessions)

Processes involved in dietary counseling- Managing resources of the communicator/counselor, Designing of counseling plans – goals & objectives, evaluation instruments. Implementation: facilitating self-management of disease condition, Evaluation: evaluating adherence to dietary changes, Counseling approaches after evaluation skills for development.

UNIT IV: (6 Sessions)

Dietary counseling through the life span - Considerations for counseling plans for: Prenatal and pregnant women, Lactating women, Childhood nutrition problems like, SAM, weight management, vitamin and mineral deficiencies, School children, adolescents, young adults, fitness, weight management, eating disorders

Managing diet related chronic diseases in adults: Obesity, Diabetes, dyslipidemia, hypertension, cancer risk prevention, renal disease, liver disorders, Geriatric counseling to provide employability & skills.

UNIT V (2 Sessions)

Nutritional/medicinal role of traditional foods-traditional food beliefs, role of Ayurveda, Naturopathy, Yoga and other traditional medicines in disease management to provide employability & skills.

Course Outcomes:

The students will be able to:

- CO 1. Gain knowledge on the basics of communication strategies and best suited methods of communicating with individuals to select appropriate strategies presented with dietary problems for global skill development.
- CO 2. Understand the importance of BCC in managing nutrition related problems to provide national employability & skills.
- CO 3. Draw out a complete counseling plan for individuals based on their physiological conditions using the appropriate tools for global skill development.
- CO 4. Understand how best to maintain adherence to changed dietary practices for specific physiological conditions to provide national employability & skills
- CO 5. Gain knowledge on traditional and alternate methods to manage disorders to provide employability & skills

PO – CO Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	2	3	2	2	2	1	2	3	2
CO2	3	3	3	1	2	1	1	3	3	3	3	3
CO3	2	1	2	3	3	3	3	3	3	1	1	2
CO4	3	3	3	3	3	3	3	2	1	2	2	3
CO5	2	3	3	3	3	3	2	1	2	1	3	3

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	3	1
CO3	3	2	1
CO4	3	3	1
CO 5	3	3	1

Suggested Readings:

1. Mahan, L. K. and Escott Stump. S. (2016) Krause’s Food & Nutrition Therapy 14th ed. Saunders-Elsevier
2. Snetselaar L. (2009). Nutrition Counseling Skills for the Nutrition Care Process. Fourth Ed. Sudbury, Massachusetts: Jones Bartlett Publishers.
3. Holli B Betsy and Beto A Judith. (2014). Nutrition Counseling and Education Skills for Dietetics Professionals. Sixth edition. USA: Lippincot Williams and Wilkins; Wolters Kluwer.
4. Gable J. (2016). Counseling Skills for dietitians. Florida, USA: JohnWiley and Sons.
5. Midwinter R and Dickson J.(2015). Embedding Counseling and Communication Skills. A Relational Skills Model. Routledge 2015
6. Devito Joseph A. (2015) Human Communication: The Basic Course. New York:Pearson
7. King K and Klawitter B.(2007). Nutrition Therapy. Advanced Counseling Skills. Third Edition. Philadelphia, USA: Lippincot Williams and Wilkins; Wolters Kluwer. 2007

Website source:

1. Carbohydrate loading, fueling exercise, Pre and post workout meal, hydration
www.slideshare.net/MUSWellness/sports-exercise-nutrition
2. Benefits, Principles, Pre and post workout meals
<https://www.slideshare.net/fitnesslex/sports-nutrition-38663048>
3. Nutrients in sports nutrition

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) II Year (IV Semester)
MHSCFN-401T: Clinical & Therapeutic Nutrition –II

Objectives:

The course will enable students to:

- Understand the role of dietitian/nutritionist in preventive, promotive & curative health care to provide employability & Skills.
- Understand the etiology, physiologic and metabolic anomalies of acute and chronic diseases and patient needs for skill development.
- Know the effect of various diseases on nutritional status and nutritional and dietary requirements for skill development.
- Be able to recommend and provide appropriate nutritional care for prevention/and treatment of the various diseases for better skilling of entrepreneurship.

UNIT I **(8 Sessions)**

Nutrition Therapy of Metabolic Disorders - Diabetes Mellitus Prevalence, Etiology, Symptoms, Types, Factors affecting normal blood glucose levels, Impaired glucose homeostasis, Diagnostic and screening criteria for diabetes, Complications of diabetes - macro-vascular and micro-vascular, Management of Diabetes, Meal planning approaches, Food exchange list, Glycemic index of foods, Sweeteners and sugar substitutes, Medications - Oral hypoglycemic drugs, Insulin, Lifestyle modification to provide employability & skills.

UNIT II **(8 Sessions)**

Nutritional Management of Renal Diseases- Physiology & functions of kidney, Kidney function tests, Diseases of kidney - Glomerulonephritis, Nephrotic Syndrome, Acute Renal Failure (ARF), Chronic Renal Failure (CRF), End Stage Renal Disease (ESRD), Dialysis - Hemodialysis, Peritoneal dialysis, Kidney Transplant, Nephrolithiasis/Renal Calculi, Etiology, Clinical signs & symptoms and medical nutrition therapy of renal diseases, Use of sodium, potassium and phosphorus exchange lists in diet planning, Psychological support and Lifestyle changes, Prevention of kidney diseases to provide employability & skills.

UNIT III **(8 Sessions)**

Nutrition and Cancer - Development & Characteristics of cancer, Etiology of cancer, Metabolic alterations during cancer - Cancer cachexia, Energy metabolism, Other metabolic abnormalities, Sensory changes, Cancer therapy - Chemotherapy, Radiation therapy, Surgery, Nutritional considerations - Oral nutritional management, Enteral tube feeding, Total parenteral nutrition to provide employability & skills

Nutrition for Bone Health – Measurement of bone mineral density (BMD), Peak bone mass (PBM), Nutrition & bone - Calcium, phosphate & vitamin D, Osteoporosis - Prevalence, types, etiology, pathophysiology & medical nutrition therapy

UNIT IV **(8 Sessions)**

Nutrition During Stress - The Stress Response

Surgery - Physiological response to surgery, Preoperative & postoperative nutritional care in minor & major surgery, Determination of nutritional support, medical nutrition therapy during surgery

Burns - Classification of burns, Complications of burns, Calculations for nutrient requirements, Dietary management & mode of nutrition support for burns, Non dietary treatment and wound management of burns

Trauma & Sepsis - Physiological response to injury, Metabolic response to injury, Hormonal response to injury, Dietary management in trauma & sepsis (Multiple Organ Dysfunction Syndrome (MODS))

Course Outcomes

The student will be able to

CO 1. Understand the importance of nutritional assessment in the care of patients to provide national employability & skills.

CO 2. Gain knowledge about causative factors and metabolic changes in various diseases/disorders and the associated principles of diet therapy to provide national employability & skills.

CO 3. Learn the principles of dietary counseling to provide employability & skills.

CO 4. Comprehend the rationale of prevention of various diseases/disorders for global skill development.

PO – CO Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	1
CO2	3	3	1
CO3	3	3	1
CO4	3	1	1

Suggested Readings:

1. Antia F.P. And Philip Abraham (2001) Clinical Nutrition and Dietetics, Oxford Publishing Company.
2. B. Srilakshmi, (2007) : Dietetics, published by K.K. Gupta For Newage International Pvt. Ltd. New Delhi.
3. Benion M. : Clinical Nutrition, Harper And Row Publishing M.Y.
4. Gopalan C., Ram Sastri B.V. And BalSubramaniam S.C., (2012) Nutritive Value of Indian Foods, Hyderabad, National Institute of Nutrition, Indian Council of Medical Research.
5. Mahan L.K., Sylvia Escott-Stump(2000) : Krause's Food Nutrition and Diet Therapy 10th Edition, W.B. Saunders Company London.
6. Passmore P. And M.A. East Wood : Human Nutrition And Dietetics, Churchill Living Stone.

Website sources:

1. Burden of Disease in India
2. [https://www.who.int/macrohealth/action/NCMH_Burden%20of%20disease_\(29%20Sep%202005\).pdf](https://www.who.int/macrohealth/action/NCMH_Burden%20of%20disease_(29%20Sep%202005).pdf)
3. National family health survey -4
http://rchiips.org/nfhs/factsheet_nfhs-4.shtml
4. Dietary Guidelines for Indians
<http://ninindia.org/DietaryGuidelinesforNINwebsite.pdf>
5. ICMR guidelines for management of type 2 diabetes 2018

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) II Year (IV Semester)
MHSCFN-402T: Food Processing and Preservation

Course Objective:

- To acquaint with properties of foods and basic principle of Food Engineering and its Processes, along with the unit operations knowledge for better employability in industry.

UNIT-I **(8 Sessions)**

Basic concept of food processing and preservation: Reason of food Spoilage and Scope of food processing preservation; principles of food processing and preservation. Principle and preservation by low temperature: (refrigeration, freezing, and dehydro freezing; cold storage, frozen food), changes during freezing-physical and chemical changes. Processing and preservation by drying: factors affecting drying rate to provide employability & skills.

UNIT-II **(8 Sessions)**

Processing and preservation by heat: (blanching, pasteurization, sterilization, UHT processing, heating, dehydration, canning, Microwave cooking-(principle, changes during microwave cooking, advantages), difference between microwave and conventional heating, Concentration and evaporation-(flash evaporator, falling film evaporator and multiple effect evaporators) to provide employability & skills.

UNIT-III **(8 Sessions)**

Processing and preservation by non-thermal method: irradiation, high pressure, pulsed electric field, high hydrostatic pressure, Hurdle technology: concept of hurdle technology and its application, Ultrasonic processing: Properties of ultrasonic, application of ultrasonic as processing techniques, IR heating; for skill development.

UNIT-IV **(6 Sessions)**

Food processing equipment's: material handling, cleaning and grading, conveyors, size reduction, food grain storage and milling, Separation Technique: filtration, agitation and mixing. Baking, Roasting, Frying. Extrusion Technology-(principle, types of extruders) for skill development

Course outcome: Student will be able to

- CO 1. Understand the basic concepts of properties of foods and basic food engineering concepts to provide employability & global skills.
- CO 2. Acquire the knowledge of various unit operations in food preservation to provide national employability & global skills.
- CO 3. Acquire the knowledge of various unit operations in food processing for global skill development.
- CO 4. Gain the knowledge of food packaging and its interaction with food products for global skill development.

PO – CO Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	1
CO2	3	3	1
CO3	3	2	1
CO4	3	2	1

Suggested Readings:

1. Arsdel WB, Copley MJ & Morgan AI. 1973. Food Dehydration.
2. 2nd Ed. Vols. I, II. AVI Publ. 2. Desrosier NW & James N. 1977. Technology of Food Preservation. 4th Ed. AVI. Publ.
3. Fellows PJ. 2005. Food Processing Technology: Principle and Practice. 2nd Ed. CRC.
4. Jelen P. 1985. Introduction to Food Processing. Prentice Hall.
5. Fellows P J (2002), Food Processing Technology- Principles and Practices, 2nd Edition. Woodhead Publishing Ltd
6. Earle RL. 1985. Unit Operations in Food Processing. Pergamon Press.
7. Fellows P. 1988. Food Processing Technology. VCH Ellis Horwood.
8. Heldman DR & Singh RP. 1995. Food Process Engineering. AVI Publ.
9. McCabe WL & Smith JC. 1971. Fundamental of Food Engineering. AVI Publ.
10. Sahay KM & Singh KK. 1994. Unit Operation of Agricultural Processing Vikas Publ. House.
11. Singh RP & Heldman DR. 1993. Introduction to Food Engineering. Academic Press

Website Resources:

1. Food processing and technology
<https://www.acs.edu.au/courses/food-processing-and-technology-721.aspx>
2. Food Science knowledge into Food Chain
<https://www.iseki-food.net/training/e-learning-Integrating>
3. FAO

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) II Year (IV Semester)
MHSCFN- 403T: Perspectives in Public Health Nutrition

Course Objectives:

- This Course will familiarize the students with the concepts of Public Health Nutrition, health care of the community, and food and nutrition security for skill development.
- The students will acquire knowledge about the causes, consequences and preventive strategies for nutritional problems in the community and also strategies for improving the nutritional and health status of communities for skill development.

UNIT I

(4 Sessions)

Public Health Nutrition and Health Care Systems- Aim, scope and content of Public Health Nutrition, Role of Public Health Nutritionist in national development, Health – definition, dimensions, determinants and indicators, Health care of the community, Health care systems for skill development.

UNIT II

(6 Sessions)

Public Health Aspects of Malnutrition - Etiology, public health implications, preventive strategies for CED/PEM, Severe Acute, Malnutrition and micronutrient deficiencies of public health significance, Public health implications and preventive strategies for Obesity, Hypertension, Coronary, Heart Disease, Diabetes, Osteoporosis, Dental Caries for skill development.

Unit III

(6 Sessions)

Approaches/ Strategies for Improving Nutrition and Health Status of the Community - Health based interventions including immunization, provision of safe drinking water/sanitation, prevention and management of diarrhoeal diseases, Food based interventions including food fortification, dietary diversification, supplementary feeding and biotechnological approaches, Education based interventions including growth monitoring and promotion (GMP), health/nutrition related behaviour change communication to provide employability & skills.

UNIT IV

(6 Sessions)

Food and Nutrition Security - Concepts and definitions of food and nutrition security at national, household and individual levels, Public Sector programmes for improving of food and nutrition security and National Nutrition Mission to provide employability & skills.

Course Learning Outcomes:

Student will be able to

- CO 1. Become familiar with the concept of public health nutrition and health care of the community for global skill development.
- CO 2. Understand the causes, consequences and preventive strategies for nutritional problems in the community for skill development.
- CO 3. Comprehend the strategies for improving nutrition and health status of communities to provide national employability & skills.
- CO 4. Acquire knowledge about the concept of food and nutrition security and the various programmes for improving food and nutrition security to provide national employability & skills.

PO – CO Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	2	1
CO3	3	3	1
CO4	3	3	1

Suggested Readings:

1. Gibney M J, Margetts B M, Kearney J M Arab (Ist Eds) (2004) Public Health Nutrition, NS Blackwell Publishing
2. Gopalan C (Ed) (1987) Combating Under nutrition- Basic Issues and Practical Approaches, Nutrition Foundation of India
3. Kaufman M (2007) Nutrition in promoting the public health strategies, principles and practices. Jones and Barlett Publishers
4. Park K (24th ed) (2017) Park’s Textbook of Preventive and Social Medicine, Jabalpur M/s. Banarsidas Bhanot
5. Dietary Guidelines for Indians (2nd ed) (2011) Dietary Guidelines for Indians: A manual., NIN
6. IFCT (2017) Indian food composition table, NIN
7. Ross A C (Eds) (2012) Nutrition in health and disease, Lippincott Williams & Wilkins
8. Shils M E (Eds) (1998) Nutrition in health and disease, Lippincott Williams & Wilkins
9. NNM: <http://www.icds-wcd.nic.in/nnm/home.html>
10. Vir S (2011) Public health nutrition in developing countries, Woodhead Publishing India Limited

Website sources:

1. Burden of Disease in India
2. [https://www.who.int/macrohealth/action/NCMH_Burden%20of%20disease_\(29%20Sep%202005\).pdf](https://www.who.int/macrohealth/action/NCMH_Burden%20of%20disease_(29%20Sep%202005).pdf)
3. National family health survey -4
http://rchiips.org/nfhs/factsheet_nfhs-4.shtml
4. Dietary Guidelines for Indians
<http://ninindia.org/DietaryGuidelinesforNINwebsite.pdf>
5. ICMR guidelines for management of type 2 diabetes 2018

IFTM University, Moradabad
Master of Science (M.Sc.) Programme
M.Sc. Home Science (Food and Nutrition) II Year (IV Semester)
MHSCFN- 451P Perspectives in Public Health Nutrition (Practical)

Course Objectives:

- To develop nutrition education program for vulnerable groups and planning nutritious dishes for micronutrient deficiencies and field visit of going government program for skill development.

Practical:

- Development of a plan for conducting nutrition education programmes in the community.
Preparation of communication aids for different groups for skill development.
- Development of low cost recipes for infants, preschoolers, adolescents, pregnant and lactating mothers for skill development.
- Planning and preparation of diet/ dishes for Protein Energy Malnutrition (PEM), Vitamin to provide employability & skills.
A Deficiency (VAD), Iron Deficiency Anaemia (IDA), obesity, hypertension, diabetes
Field visits to ongoing national nutrition programmes for skill development.

Course Outcomes:

Student will be able to

- CO 1. Become familiar with the concept of public health nutrition and health care of the community for global skill development.
- CO 2. Understand the causes, consequences and preventive strategies for nutritional problems in the community for global skill development.
- CO 3. Comprehend the strategies for improving nutrition and health status of communities to provide national employability & skills.
- CO 4. Acquire knowledge about the concept of food and nutrition security and the various programmes for improving food and nutrition security for global skill development.

PO – CO Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

CO- Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	3
CO2	3	2	3
CO3	3	3	3
CO4	3	2	3

Suggested Readings:

1. Chadha R , Mathur P (2015) Nutrition A life cycle Approach, Orient Black Swan Pvt. Ltd, Lady Irwin College
2. Dietary Guidelines for Indians (2nd ed) (2011) Dietary Guidelines for Indians: A manual., NIN
3. IFCT (2017) Indian Food Composition Tables, NIN
4. Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra S (4th ed) (2010) Basic food preparation, Lady Irwin College
5. Khanna, K, Gupta, S, Sethi, R, Mahna, R, Rekhi, T, 2004. The Art and science of cooking-A Practical Manual. Elite Publishing House Pvt. Ltd.

Website sources:

1. Burden of Disease in India
2. [https://www.who.int/macrohealth/action/NCMH_Burden%20of%20disease_\(29%20Sep%202005\).pdf](https://www.who.int/macrohealth/action/NCMH_Burden%20of%20disease_(29%20Sep%202005).pdf)
3. National family health survey -4
http://rchiips.org/nfhs/factsheet_nfhs-4.shtml
4. Dietary Guidelines for Indians
<http://ninindia.org/DietaryGuidelinesforNINwebsite.pdf>
5. ICMR guidelines for management of type 2 diabetes 2018

IFTM University, Moradabad
Master of Science (M.Sc.) programme
M.Sc. Home Science (Food and Nutrition) II Year (IV Semester)
MHSCFN- 452P: Dissertation

Dissertation

Each student has to carry out the dissertation work immediately after registration in the Third Semester and submit the final dissertation containing Introduction, Literature review, objectives, Hypothesis, Methodology, Result & discussion, summary, conclusion, recommendation references etc. for evaluation by one internal & one external examiner in the end of Fourth Semester. The candidate has to submit two copies and a soft copy of the final dissertation to the head of the department. The H.O.D will forward the dissertation to the examiner for evaluation.