M.Sc.,
HOME SCIENCE

SYLLABUS

FROM THE ACADEMIC YEAR

2023 – 2024

TAMILNADU STATE COUNCIL FOR HIGHER EDUCATION, CHENNAI – 600 005

CONTENT:

OUTLINE OF THE CURRICULUM AND TEMPLATE FO RCOURSE SYLLABUS

Introduction to the Programme

Highlights of the Programme

Programme Outcomes (PO) of PG Degree Programme

Programme Specific Outcomes (PSO) of PG Degree Programme

Teaching Methodologies

Template For Curriculum Design for PG Degree Programme

Credit Distribution for PG Programme

Consolidated Semester Wise and Component Wise Credit Distribution

Methods of Evaluation

INTRODUCTION

Home Science is both multidisciplinary and interdisciplinary in its context encompassing fmajor disciplines which includes Foods and Nutrition, Nutrition, Food Service Management & Dietetics, Clinical Nutrition & Dietetics, Food Science Technology and Nutrition and Nutrition & Dietetics with hospitality management, Hospital Administration, Food Service Management and Food Processing. Each area has one or more specific areas of specialization. Each specialization under Home Science offers a wide array of courses that prepares students for employment or setting up an enterprise in a wide range of sectors such as healthcare, childcare, food and hospitality, textiles, home and office interiors. Further, all courses of the programme are designed to improve the lifestyle of the individual, family and society that could most certainly contribute to the holistic development of the community.

The primary **objective** of this course curriculum was to introduce the fundamental concepts of nutrition by exploring current nutritional issues of relevance in their lives. Students are prepared for a wide range of careers as health educators, researchers, personal trainers, public health planners and more. The course curriculum for this programme has been planned to improve the employability potential and increase the scope for higher education. This programme facilitates action-based research in the various fields with the advantage of nurturing critical and analytical thinking that pave the way for innovation and entrepreneurship.

Highlights of the Revamped Curriculum

- The curriculum focusses on meeting the demands of the Food industry, Entrepreneurs, Public health sector, Hospitality industries, Healthcare and social welfare sectors.
- This student centric programme ensures knowledge and skill development by providing hands on training, on-the-job internships, projects, lab practices, experiential activities ,exposure to entrepreneurial skills and training for competitive examinations.
- The course contentis comparabletoworldclass curriculum.

- Thecourses are updated to include recent developments in the field of HomeScience-Food science Nutrition and Dietetics.
- References are updated and web resources are cited.
- Each course in the curriculum carries either a practical/activityor experiential learningcomponentto ensure skill development along with acquiring knowledge in the subject.
- Potentialfor employabilityhas been enhanced through mandatoryinternships.
- Digitalliteracyandcompetencyisensured usingICT enabledlearningenvironment.

TANSCHE REGULATIONS ON LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK FOR POSTGRADUATE EDUCATION	
Programme	**M.Sc., Home Science**
Programme Code	
Duration	**2 years for PG**
Programme Outcomes (Pos)	**PO1: Problem Solving Skill** Apply knowledge of Management theories and Human Resource practices to solve business problems through research in Global context. **PO2: Decision Making Skill** Foster analytical and critical thinking abilities for data-based decision-making. **PO3: Ethical Value** Ability to incorporate quality, ethical and legal value-based perspectives to all organizational activities. **PO4: Communication Skill** Ability to develop communication, managerial and interpersonal skills. **PO5: Individual and Team Leadership Skill** Capability to lead themselves and the team to achieve organizational goals. **PO6: Employability Skill** Inculcate contemporary business practices to enhance employability skills in the competitive environment. **PO7: Entrepreneurial Skill** Equip with skills and competencies to become an entrepreneur.

	PO8: Contribution to Society Succeed in career endeavors and contribute significantly to society. **PO 9 Multicultural competence** Possess knowledge of the values and beliefs of multiple cultures and a global perspective. **PO 10: Moral and ethical awareness/reasoning** Ability to embrace moral/ethical values in conducting one's life.
Programme Specific Outcomes (PSOs)	**PSO1 – Placement** To prepare the students who will demonstrate respectful engagement with others' ideas, behaviors, beliefs and apply diverse frames of reference to decisions and actions. **PSO 2 - Entrepreneur** To create effective entrepreneurs by enhancing their critical thinking, problem solving, decision making and leadership skill that will facilitate startups and high potential organizations. **PSO3 – Research and Development** Design and implement HR systems and practices grounded in research that comply with employment laws, leading the organization towards growth and development. **PSO4 – Contribution to Business World** To produce employable, ethical and innovative professionals to sustain in the dynamic business world. **PSO 5 – Contribution to the Society** To contribute to the development of the society by collaborating with stakeholders for mutual benefit.

M.Sc., HOME SCIENCE

S.No	Paper Code	Courses	Title of the paper	T/P	Credits	Hours/ Week	Marks		
			I Semester				**I**	**E**	**Total**
I	23MHF1C1	CC-I	Advanced Food science	T	6	6	25	75	100
	23MHF1P1	CC-II	Advanced Food Science - Practical	P	4	6	25	75	100
	23MHF1C2	CC– III	Advanced Human Physiology	T	6	6	25	75	100
	23MHF1E1/ 23MHF1E2	DSE –I	(i) Family Resource Management - concept and context / (ii) Diabetic care and Education	T	3	6	25	75	100
	23MHF1E3/ 23MHF1E4	DSE- II	(i) Perceptives of Home Science / (ii) Fashion Design	T	3	6	25	75	100
					22	**30**	**125**	**375**	**500**
			II Semester						
II	23MHF2C1	CC-IV	Advanced Nutrition and Dietetics	T	5	6	25	75	100
	23MHF2P1	CC-V	Advanced Nutrition and Dietetics – Practical	P	5	6	25	75	100
	23MHF2C2	CC– VI	Advances in Textiles and Clothing	T	4	6	25	75	100
	23MHF2E1/ 23MHF2E2	DSE –III	(A) Nutritional Biochemistry / (B) Food Product Development	T	3	4	25	75	100
	23MHF2E3/ 23MHF2E4	DSE-IV	(A) Food safety and Quality control / (B) Guidance and Counselling	T	3	4	25	75	100
	23MHF2S1/ 23MHF2S2	SEC-I	(A) Food preservation / (B) Maternal Nutrition	T	2	4	25	75	100
					22	**30**	**150**	**450**	**600**
			III Semester						
III	23MHF3C1	CC-VII	Research Methodology and Statistics	T	5	6	25	75	100
	23MHF3C2	CC-VIII	Trends and Issues in Human Development	T	5	6	25	75	100
	23MHF3C3	CC-IX	Home Science Extension Education and communication	T	5	6	25	75	100
	23MHF3C4	CC-X	Institutional Food service management	T	4	6	25	75	100

	23MHF3E1/ 23MHF3E2	DSE-V	(A) Food processing and Technology/ (B) Surface Embellishments	T	3	3	25	75	100
	23MHF3S1/ 23MHF3S2	SEC-II	(A) Sports Nutrition / (B) Scientific Writing	T	2	3	25	75	100
	23MHF3I/ 23MHF3IA		Internship / Industrial Activity in Hospitals	PR	2	--	25	75	100
					26	**30**	**175**	**525**	**700**
IV Semester									
	23MHF4C1	CC-XI	Public health nutrition	T	5	6	25	75	100
	23MHF4C2	CC-XII	Nutrition Through Life Cycle	T	4	6	25	75	100
	23MHF4D	CC-XIII	Dissertation with Viva voce	PR	6	10	25	75	100
	23MHF4E1/ 23MHF4E2	DSE-VI	(A) Nutrition for Health and Fitness / (B) Organisation and Administration of Early Childhood Care and Education	T	3	4	25	75	100
	23MHF4S1	Professional Competency Skill	Home Science for Competitive Examinations	T	2	4	25	75	100
	23MEA4		Extension Activity	P	1	-	25	75	100
			Total		**21**	**30**	**150**	**450**	**600**
					91	**-**	**600**	**1800**	**2400**

I YEAR – I SEMESTER

COURSE CODE 23MHF1C1	CORE COURSE	T/P	C	H/W
	ADVANCED FOOD SCIENCE	T	6	6

COURSE OBJECTIVES:

To enable the students

1. Gain knowledge on the source and properties of food
2. Familiarize students with changes occurring in various foodstuffs as a result of processing and cooking.
3. Enable students to use theoretical knowledge in various applications and food preparations.

	CONTENT	HOURS
UNIT I	**1. Properties of Food** - Food nutrients, solids, solutions and colloids, Solutions - Physical properties of solutions, classification of foods based on viscosity characteristics. Solutes-chemical properties, Food dispersion: Colloids- Types of colloid and properties of colloids and rheology of food dispersions; Structure, formation and stability of gels, sols, emulsion and foams. **2. Starch** - Sources, Structure and composition of starch; Properties and characteristics of food starches; Modified food starches-Structure and composition, Effect of heat on food starch properties, gluten formation in wheat flour, influencing factors[gluten], gelatinization, gelation and retrogradation, dextrinization and factors affecting gelatinization.	**20**
UNIT II	**1. Proteins** - Structure and composition, Classification and properties of proteins; Effect of heat on physio-chemical properties of proteins; Role of proteins in food products; Texturized vegetable protein, protein concentrates. **2. Enzymes** - Classification and its nature; Mechanism of action; Factors influencing enzyme activity; Role of enzymes in food products; Immobilized enzymes and its application in food industries.	**15**
UNIT III	**1. Fats and Oils** - Structure, composition and properties of fats and oil; storage of fat, characteristics [shortening, plasticity, flavor, retention of moisture, melting point, optical activity, colour, specific gravity], Hydrogenation, winterization, flavor reversion, smoking point, Rancidity - Types, Mechanism and prevention; Role of fat/oil in food products; Fat substitutes. **2. Sugar and Sugar Products** - Types of sugar, Types of granulated sugar, Physical and chemical properties, Sugar products -Types of honey, Jaggery, corn syrup, various forms of sugar used in cookery and Crystallization of sugar.	**20**
UNIT IV	**1. Milk and Milk Products** - water, carbohydrate, milk fat, milk protein, minerals and other components in milk, Physiochemical properties of milk, Effect of physical and chemical factors on milk components [Effect of heat, protein, factors affecting coagulation, casein coagulation, minerals, Non-enzymatic browning], [Effects of acid], Effects of enzymes-renin, fermented and non-fermented milk products.	**20**

	2. Egg - Proteins in Egg, microscopic structure of egg, characteristics [color, size], Nutritional qualities, quality check, functional properties- foaming, factors affecting foam formation.	
UNIT V	**1. Food Additives** - Definition, different food additives and Need for food additives. Flavour compounds in vegetables, fruits and spices; Effect of processing on food flavours; Role of colours and flavours in food products. **2. Sweetners** - Properties, Artificial and Natural sweetners and role of sweetners in food industry.	**15**
	Total	**90**

TEXT BOOKS:

1. Srilakshmi B. (2015). **Food Science.** New Age International (P) Ltd Publishers.
2. Reddy S.M. (2015). **Basic Food Science and Technology.** New Age International Publishers.
3. Avantina Sharma (2017). **Text book of Food Science and Technology.** CBS Publishers and Distributes Ltd. 3rd Edition.
4. Swaminathan A. (2018). **Handbook of Food and Nutrition.** Bangalore Press.
5. Serpil Sahin and Servet Gulum Sumnu. (2006). **Physical Properties of Foods.** Springer Publications.

REFERENCES:

1. Gerard L. Hasenhuett and Richard W. Hartel (2019). **Food Emulsifiers and their Applications.** Springer publications. 3rd edition.
2. Vickie. A. Vaciavik (2021). **Essentials of Food Science.** Springer publications. 5th edition.
3. Swaminathan M. (2015). **Advanced Text Book of Food and Nutrition.** volume-2. Bapco publications.
4. Eskein.(2012). **Biochemistry of Food.** Elsievier publications.
5. Lyn Obrien Nabors (2001). **Alternative Sweetners.** Taylor and Francis Publications.
6. Janet D. Ward and Larry Ward. (2006). **Principles of Food Science.** Stem Publishers. 4th Edition.

E - LEARNING RESOURCES:

1. www.fao.org
2. www.wfp.org
3. www.foodrisk.org.
4. http://www.fsis.usda.gov/
5. https://www.fda.gov/food

COURSE OUTCOME:

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

CO No.	CO Statement
CO1	Overview the relationship between the chemical structure and the properties of the main components in food like starch, protein and lipids.
CO2	Understand the Composition and characteristics of various food commodities.
CO3	Explain the cooking quality of foods and apply food science knowledge in food industries
CO4	Identify and understand the nutrients and functions of foods in maintaining health
CO5	Analyze the proper use of food colors and food additives in safe food preparation.

Mapping CO with PSO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	2	3	2
CO2	3	3	3	2	1	2
CO3	3	3	3	3	3	2
CO4	2	3	3	2	1	3
CO5	3	3	3	2	2	3
Average	2.8	3	2.8	2.2	2	2.4

PEDAGOGY:

Lecture, Case study, journal reviewing, Assignments, Group discussion, Power point presentation.

I YEAR – I SEMESTER

COURSE CODE 23MHF1P1	CORE COURSE-II	T/P	C	H/W
	ADVANCED FOOD SCIENCE PRACTICAL	P	4	6

COURSE OBJECTIVES:

To enable the students

1. Comprehend the knowledge gained on characteristics and properties of foods during cooking
2. Apply the properties of food in various food processing and preparations Analyse the factors affecting cooking quality of foods
3. Create appropriate food preparation and processing methods to ensure quality standards.

	CONTENT	HOURS
UNIT I	1. **Sensory method** – Analysis of taste sensitivity - Threshold test, Duo – Trio test, Multiple sample difference. **2. Starch** - Microscopic structure and gelatinization. Factors affecting gelatinization – sag test. Gluten formation.	15
UNIT II	1. **Pulses** - Factors affecting cooking quality **2. Fruits**- Enzymatic, browning, Pectin test and Firmness of gel.	20
UNIT III	1. **Vegetables -** Various method of cooking fat soluble and water-soluble pigment **2. Milk** - Detecting the presence of starch, soda, starch, urea in milk sample. pH of milk sample. Effect of acid on milk, Maillard reaction.	15
UNIT IV	**1. Sugar** - Relative sweetness of sugar- sucrose, maltose, lactose, fructose, dextrose, glucose, artificial sweeteners, Stages of sugar cookery, Effect of dextrose, jaggery, honey and cream of tartar on sucrose. **2. Fats and Oils** - Smoking Point – Groundnut Oil, Coconut oil, Gingelly Oil, Vanaspathi, Ghee, Refind sunflower oil, Rice bran oil. Cooking Temperature and fat absorption - Groundnut oil, coconut oil, Gingelly oil, Refined Sunflower oil, Rice bran oil.	20
UNIT V	**PHYSICAL PROPERTIES** – (a) Thousand grain weight, (b) Thousand grain volume (c) Hydration capacity, (d) Hydration index, (e) Swelling capacity, (f) Specific gravity, (g) Seed displacement test, (h) Viscosity - Line spread test, (i) Viscometer. 2.Adulteration.	20
	Total	90

TEXT BOOKS:

1. Srilakshmi B. (2015). **Food Science,** New Age International (P) Ltd. Publishers.
2. Potter N. and Hotchkiss J.H. (1996). **Food Science**, Fifth ed., CBS Publishers and Distributors, New Delhi.
3. Avantinasharma (2017). **Text Book of Food Science and Technology.** CBS Publisheres and distributes ltd. 3rd Edition.
4. Reddy S.M. (2015). **Basic Food Science and Technology.** New Age International publishers. 2ND edition.

REFERENCES:

1. Swaminathan A (1979) . Food Science And Experimental Foods, Ganesh and Company Madras. 3rd edition.
2. Bennion, Marion and O. Hughes (2001). Introductory Foods. Edi: mac millian N. Y. 1st edition.
3. Eskein. (2012). Biochemistry of Food. Elsievier publications

4. Desrosier, N.W. and James N. (2007). Technology of food preservation. AVI Publishers.
5. Manay, S. and Shadaksharamasamy, (2004) .Food: Facts and Principles, New Age nternational Publishers, New Delhi. 1st edition.

E - LEARNING RESOURCES

1. http://www.fao.org/3/V5030E/V5030E00.htm https://fmtmagazine.in/fruits-vegetables-processing-technologies/
2. www.fao.org www.wfp.org
3. Learn Microbiology with Online Courses and Classes | edX

COURSE OUTCOME:

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

CO No.	CO Statement
CO1	Gain knowledge on sensory analysis and cereal cookery Concept
CO2	Understand the properties of various food.
CO3	Analyze the cooking quality of foods and apply knowledge in food industries.
CO4	Identify and understand the Physical characteristics.
CO5	Revise appropriate food preparation and processing methods to ensure standards in food industry.

Mapping of CO with PSO:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	3	3	2
CO2	3	3	3	2	3	3
CO3	3	2	3	3	3	3
CO4	3	3	3	2	2	3
CO5	3	3	2	3	3	2
Average	3	2.8	2.6	2.8	2.8	2.6

PEDAGOGY - Experiments, Planning recipes, Group Discussion, Assignments.

I YEAR – I SEMESTER

COURSE CODE 23MHF1C2	CORE COURSE-III	T/P	C	H/W
	ADVANCED HUMAN PHYSIOLOGY	T	6	6

COURSE OBJECTIVES:

This course will enable students to :

1. Advance their understanding of some of the relevant issues and topics of human physiology.
2. Enable the students to understand the integrated function of the system understand alterations of structure and function in various organs and systems in disease conditions**.**

	CONTENT	HOURS
UNIT I	**Cell -** Structure and Function. Transportation across cell membrane. Cell theory and Cycle. Difference between Meiotic and Mitotic cell. Stem cells- types and functions. **Tissue -** Structure and Function.	**15**
UNIT II	**Blood -** Composition& Functions, Blood Group – ABO System & Rh factor. Blood Coagulation. **Heart -** Structure &Function of Heart and Blood Vessels. Systemic &Pulmonary circulation, Cardiac cycle and Conduction. Heart rate and Cardiac output. ECG. Blood pressure & their regulations.	**20**
UNIT III	**Respiratory System -** Structure and function. Gas Laws pertaining to Gas Exchange (Meaning only)-Henry's Law of Partial Pressure, Boyle - Mariotte's Law of Volume and Pressure, Dalton's Law of Partial Pressure, Charles's Law of Ideal Gas Equation and Fick's Law of Diffusion. Mechanism of respiration. Circulation and Exchange of respiratory gases. Internal and External Respiration. Chloride shift. Definitions of Lung volumes and Lung capacities, Ventilation and Artificial Respiration. **Immunity -** Definition and types Innate and Acquire immunity. **Endocrine System -** Hormones and its type. Syndromes resulting from hypo and hyperactivity of Pituitary, Thyroid, Adrenals and Pancreas.	**20**
UNIT IV	**Gastrointestinal System -** Structure and function of GI tract and its accessory organs. Digestion and absorption of Carbohydrates, Proteins and Fats. **Reproductive System -** Roll of hormones in reproduction and Lactation. Menstrual Cycle and Menopause. Invitro (IV) fertilization, Spermatogenesis.	**15**
UNIT V	**Nervous System -** Structure and Function of Neuron. Afferent and Efferent Nerves. Conduction of Nerve Impulse- Synapses, Neurotransmitters, Summation and Action Potential. Sympathetic and Parasympathetic nervous System. Cerebrospinal fluid (CSF) – composition and function. Blood - brain barrier (BBB). Electroencephalogram (EEG). **Excretory System** **Renal System -** Organs in the Urinary System. Structure and functions of Nephron. Juxtaglomerular Cell. Mechanism of formation of urine, Role of kidney to regulate Blood pressure, Water, Electrolytes and Acid Base Balance. **Skin -** Structure and function**.** Regulation of temperature of the body.	**20**
	Total	**90**

TEXT BOOKS :

1. Sembulingam K. & PremaSembulingam (2019), Essentials of Medical Physiology. Jaypee publications. Eighth edition.
2. Waugh A, Ross and Wilson (2018). Anatomy and Physiology in Health and Illness. Elsevier publications. 13ed.
3. Chatterjee C.C. (2020). Human Physiology. CBS publishers. 13 ed.
4. Indu Khurana (2020). Medical Physiology for Undergraduate Students. Elsevier Publication. 2 Edition.
5. Pal G.K. (2019). Textbook of Human Physiology, Elsevier publications. 3edition.

REFERENCES:

1. Guyton, A.G. and Hall, J.B. (2005): Text Book of Medical Physiology. W.B.Sanders Company, Prism Books (Pvt.) Ltd., Bangalore. 9th Edition.
2. Wilson, K.J.W and Waugh, A. (2003): Ross and Wilson Anatomy and Physiology in Heathand Illness. Churchill Livingstone. 8th Edition.
3. Jain, A.K.: Textbook of Physiology. Avichal Publishing Co., New Delhi. Vol.I and II.
4. McArdle, W.D., Katch, F.I. and Katch V.L. (2001): Exercise Physiology. Energy, Nutritionand Human Performance. Williams and Wilkins, Baltimore. 4th Edition.
5. Ganong, W.F. (1985): Review of Medical Physiology. lange Medical Publication. , 12th Edition.
6. Moran Campell E.J., Dickinson, C.J., Slater, J.D., Edwards. C.R.W. and Sikora, K. (1984): Clinical Physiology. ELBS, Blackwell Scientific Publications. , 5th Edition.
7. McArdle, W.D., Katch, F.1. and Katch, V.L. (1996): Exercise Physiology. Energy, Nutrition and Human Performance, Williams and Wilkins, Baltimore. 4th Edition.
8. Jain, A.K.: Textbook of Physiology. Avichal Publishing Co., New Delhi. Vol. I and II.
9. Winword. Sear's Anatomy and Physiology for nurses. London, Edward Arnell.
10. Chatterjee Chandi Charan : Text Book of Medical Physiology, London W.B.

E LEARNING CONTENT

1. **https://youtu.be/MZDy0RvA52Y-Osmosis**
2. **https://youtu.be/TgcyiVQnVBs- Respiratory system**
3. **https://youtu.be/44B0ms3XPKU- nervous system**

COURSE OUTCOME:

On successful completion of the course the student will be able to-

CO No.	CO STATEMENT
CO 1	Develop insight of normal functioning of all the organ systems of the body and their interaction. Understand the current state of knowledge about the functional organization of Human Cell and Histology.
CO 2	Understand the structural and functional organization of Blood and Cardiac System
CO 3	Understand the structural and functional organization of Respiration, Immunity and Endocrine GIT and Urinary System
CO 4	Comprehend the structural and functional organization Digestive System and Reproductive System
CO 5	Understand the structural and functional organization of Skin, Nervous and Excretory system

Mapping: (CO/PSO)

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	1	3	3	2	3
CO2	3	1	3	3	2	3
CO3	3	1	3	3	2	3
CO4	3	1	3	3	2	3
CO5	3	1	3	3	2	3

PEDAGOGY

Lecture, Power Point Presentation, Demonstration, Group Discussion, Assignment, Library Visits, Seminars and Oral & Written Revision

I YEAR – I SEMESTER

COURSE CODE 23MHF1E1	DSE-I	T/P	C	H/W
	FAMILY RESOURCE MANAGEMENT – CONCEPT AND CONTEXT	**T**	**3**	**6**

COURSE OBJECTIVES:

This course will enable the students to

1. Understand the factors motivating management acquire ability,
2. use human resources and gain knowledge about management of family resources,
3. know the importance of decisions in management,
4. understand the functions of market, consumer problems and protection.

	CONTENT	HOURS
UNIT I	Factors motivating management: Human Values - meaning, sources, origin, characteristics, factors influencing values, changes in values and their causes. Goal - types, characteristics, factors influencing goals, Standards - conventional and modern, flexible and rigid. Introduction to Management, concept and definition of management, Management in family living - importance, managerial function of families.	**15**
UNIT II	Resources and their management in the family - definition, characteristics, usefulness of resources, classification of resources, factors affecting the use of resources, guidelines for the use of resources. Decision making - steps in decision making, types. Management Process-Planning, controlling and evaluating.	**20**
UNIT III	Management of time and Money - Management of time - Characteristics and nature of time, Tools in time management - time cost, time norms, peak loads, work units, work curves, rest periods. Process of managing time Planning, Controlling and evaluating. Management of money - Definition, types of income and their sources - Money income, Real income. Psychic income, Family budget and Savings.	**20**
UNIT IV	Management of energy and Ergonomics - Management of energy – Planning, Controlling - body mechanics, fatigue - meaning, causes, types, avoidance of fatigue and evaluating. Work Simplification - meaning, importance, Mundel‘s Classes of changes in household activities Ergonomics and work environment – Ergonomics - definition, scope and importance. Work place designs in relation to affective, cognitive, temporal, and physical components. Work station design for computer users. Functional designs of Kitchen and other storage areas.	**20**
UNIT V	Human wants and consumer choice - nature, classification, concept of marginal utility - law of diminishing marginal utility, principles of equi-marginal utility. Consumer market - functions, types of market, price determination in the market. Consumerism - meaning of consumer and consumerism, Status of consumer in India-consumer rights and responsibilities, problems faced by consumer and the role of Government and NGO towards consumer protection.	**15**
	Total	**90**

BOOKS FOR REFERENCE :

1. Nickell and Dorsey,1991,Management of Family living, Willey Eastern Limited
2. Deacon R & Firebaugh F. 1981. Family Resource Management – Principles and Applications. Allyn& Bacon. Boston.
3. Kapur, S.K. (1996): Professional Management, S.K. Publishers, New Delhi.
4. Sherman A_W. et al (1988): Managing Human Resources, South-Western Publication Co Cincinnati.
5. Veena, G.O., Krishana and S. Promila. (2010).Essential of Ergonomics, Dominant publishers and distributors

COURSE OUTCOME:

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

CO No.	CO Statement
CO1	Gain knowledge on factors influencing values, goals and standards, concept of Management.
CO2	Understand the types of resources and its characteristics, decision making process.
CO3	Gain knowledge on management of time and money and concept of budget and family planning.
CO4	Identify and understand the energy management and to know the concept of ergonomics.
CO5	Understand Human wants and consumer choice, law of diminishing marginal utility.

Mapping of CO with PSO:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	3	3	2
CO2	3	3	3	2	3	3
CO3	3	2	3	3	3	3
CO4	3	3	3	2	2	3
CO5	3	3	2	3	3	2
Average	3	2.8	2.6	2.8	2.8	2.6

PEDAGOGY – Lecture, Group Discussion, Power point presentation and Assignments,

I YEAR – I SEMESTER

COURSE CODE 23MHF1E2	DSE-I	T/P	C	H/W
	DIABETIC CARE AND EDUCATION	**T**	**3**	**6**

COURSE OBJECTIVES:

1. To obtain in-depth knowledge about Diabetes Mellitus (DM)
2. To make the students aware of various complications during Diabetes Mellitus.
3. To gain knowledge about the management of Diabetes Mellitus through diet, exercise and medication

UNIT I	**Diabetes** : Introduction, definition, and meaning, classification of diabetes mellitus and risk factors, diabetic food pyramid. Prevalence - International, national and state.
UNIT II	**Pathological Changes in Metabolism**: Pathophysiology of Diabetes Mellitus. Pathological changes in other systems- Eye, C.V system, Neuropathy, Nephropathy and Micro vascular. Diagnosis and routine investigations-Monitoring the blood glucose level, Urine testing for the presence of sugar, random blood glucose, GTT.
UNIT III	**Complication in Diabetic Emergencies:** Diabetic ketoacidosis-hyperglycemia-hyperosmolarnon keto coma, lactic acidosis. Complication in diabetes eye- types of ocular complication in diabetes- diabetic retinopathy-estimating burden, classification, features, diagnosis of screening-averting retinopathy tight control of blood glucose.
UNIT IV	**Cardiovascular Complication in Diabetes :** prevention of CVD in diabetics -managing acute MI and unstable angina. **Diabetic nephropathy** Hyperglycemia and kidney function-correlation, population at risk and their chance to develop nephropathy-disease profession in diabetic kidney disease. Criteria for screening and diagnosis for diabetic nephropathy-treatment and prevention of nephropathy-End stage renal disease.
UNIT V	**Diabetic Neuropathy**: Classification of neuropathy-peripheral neuropathy-sexual dysfunction- automatic neuropathy- consequence of neuropathy-diagnosis and screening-glycemic control in management of diabetic neuropathy-diagnosis management of diabetic neuropathic foot ulceration.

BOOKS FOR REFERENCE:

1. L. Kathleen Mahan, Sylvia Escott-Stump, (2000). "Krause's Food Nutrition and Diet Therapy" W.B. Saunders Company, London.
2. Maurice E.Shils, James A. Olson, Moshe Shike, A. Catharine Ross, (1994), Modern Nutrition in Health AND Disease" Lippincott Williams and Wilkins publication, London.
3. B.Srilakshmi. (2005), "Dietetics" New Age International (P) Limited, New Delhi.
4. American Diabetes Association guidelines,(2010)

I YEAR – I SEMESTER

COURSE CODE 23MHF1E3	DSE-II	T/P	C	H/W
	PERCEPTIVES OF HOME SCIENCE	T	3	6

COURSE OBJECTIVES:

To enable students to have a sound knowledge in various branches of Home Science for strengthening the extension and research base.

SPECIFIC OBJECTIVES OF LEARNING:

On successful completion of these units, students are expected :

1. To describe the importance of each branch of Home Science
2. To understand the essence of each subject
3. To prepare them for UGC NET, SLET and ASRB

	CONTENT	HOURS
UNIT I	**Extension Education** Meaning, Definition, objectives, characteristics, principles a. Extension teaching methods- types and methods b. Qualities of a good Extension Worker **c.** Communication, Innovation and Social change	**15**
UNIT II	**Human Development** a. Growth, Development, Maturation and Learning b. Principles and Developmental stages &Task c. Parental Disciplinary Techniques – merits and demerits d. Early Childhood Education – Objectives. Types of Nursery Schools. e. Exceptional children – Deaf, Blindness, Physical Impairment, Mental Retarded and Giftedness . Rehabilitation.	**20**
UNIT III	**Textiles and Clothing** a. Classification and General properties textile fibres. b. Processing and manufacture of Cotton, Silk, Wool and Rayon fibres. c. Yarn: Classification. d. Fabric construction - woven, non-woven and knitted fabric e. Clothing: selection for the family.	**20**
UNIT IV	**Family Resource Management** a. Home Management – Meaning, objectives and process b. Resources - Classification and characteristics c. Time, Money and Energy management d. Decision making - Steps and Methods of resolving conflicts e. Work simplification - Importance of work simplification. Mundel's classes of Change **f.** Principles and Elements of Interior design, Various colours and colour schemes.	**15**
UNIT V	**Nutrition and Dietetics** a. Definition – Nutrition, Balanced diet, Reference man and Woman b. Food – Classification and Functions, Systematic dynamic action of food, Thermic effect of food, Bomb calorimeter. c. Nutrients – definition, Macro and Micro Nutrients (Calcium, Iron, Zinc and Iodine) deficiencies and Excess disorders. d. Types of Diet, Principles of Planning Diets. e. Recommended Dietary Allowances for different age groups.	**20**

	f. Non-communicable disorders - Principles of diet, Aetiology, types and treatment (Obesity and underweight, CVD, Diabetic Mellitus, Gastrointestinal diseases, diseases of liver and pancreas and Renal Diseases)	
	Total	**90**

TEXTBOOKS:

1. Jha, J.K. (2002). Encyclopaedia of Teaching of Home Science, Vol.I,II and III . New Delhi: Anmol Publications.
2. Suriakanthi.A., (2002). Child Development – An Introduction. Gandhigram: Kavitha Publications.
3. Srilakshmi.B. (2015). Food Science. New Delhi. New Age International Pvt.Ltd.
4. PremlataMullick (2016), 4TH edition, Kalyani Publishers.

REFERENCES:

1. Serene and Ahlawat Santos Shekhar (2013), Textbook of Home Science Extension Education.
2. Tami James Moore and Sylvia M.Asay (2008), Family Resource Management, Sage Publications.
3. Diane E. Papalia (2004), 9th edition, Human Development, McGraw Hill India.
4. Rani K. Sudha and Srivastava Sushila, Textbook of Human Development: A lifespan development approach, S. Chand & Co Ltd.

COURSE OUTCOME:

On successful completion of the course the student will be able to-

CO No.	CO STATEMENT
CO 1	Understand the concept of Extension Education and its importance.
CO 2	Comprehend the key aspects of human growth and development and realize the importance of mastering developmental tasks of each life span stage
CO 3	Understand the basic concepts of Textile and Clothing
CO 4	List personal goals and values, set living standards
CO 5	Understand the meaning of Guidance and Counselling and Career perspectives in Home Science

Mapping: (CO/PSO)

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	1	3	3	1	3
CO2	3	2	3	3	2	3
CO3	3	2	3	3	1	3
CO4	3	2	3	3	1	3
CO5	3	1	3	3	1	3
Average	**3**	**1.6**	**3**	**3**	**1.2**	**3**

PEDAGOGY

Lecture, Power Point Presentation, Demonstration, Group Discussion, Assignment, Library Visits, Seminars and Oral & Written Revision.

COURSE CODE	DSE-II	T/P	C	H/W
23MHF1E4	FASHION DESIGN	T	3	6

COURSE OBJECTIVES:

1. To study the terms related to Fashion Industry and
2. To learn the basics of fashion designing.

	CONTENT
UNIT I	Terms related to the fashion industry - fashion, style, fad, classic, and collection, chic Custom made, mannequin, fashion, show, trend, forecasting, high fashion, fashion cycle, haute couture, couture, couturier, fashion director, fashion editor, line, knock – off avant-garde, bridge, buying house, apparel, fashion merchandising, pre– a– porter, sample.
UNIT II	Design – definition and types structural and decorative design, requirements of a good structural and decorative design. Elements of design –line, shape or form, colour, size and texture. Application of structural and decorative design in a dress. Principles of design-balance–formal and informal, rhythm- through repetition, radiation and gradation, emphasis, harmony and proportion. Application of principles of designs in a dress.
UNIT III	Colour - definition, colour theories - prang colour chart and munsell colour system, Dimensions of colour - hue, value, and intensity. Standard colour harmonies- application in dress design. Colour in principles of design - application of the same in dress design.
UNIT IV	Deigning dresses for unusual figures - becoming and unbecoming – for the following figure types. Stout figure, thin figure, slender figure, narrow shoulders, broad shoulders, round shoulders, large bust, flat chest, large hip, large abdomen, round face, large face, small face, prominent chin and jaw, prominent forehead.
UNIT V	Introduction to Fashion accessories, trimmings and decoration. Wardrobe planning for different age groups, factors influencing wardrobe selection, Fashion and season, Designing dresses for different occasions - business meetings, parties / dinners, evenings/ leisurehours,marriage functions,sports, uniformsfor civilservice, airhostess, hoteliers, schools– girlsand boys(school, high school).

REFERENCE:

1. Fashion Sketch Book – Bina A bling, Fair Child Publications, NewYork: Wardrobe
2. Strategies for Women – Judith Rasband, Delmar Publishers; London.
3. Fundamentals of Textiles and their Care - Susheela Dantyagi, 5th edition, orient Longman Ltd., New Delhi.
4. Inside the Fashion Business – Heannette A Jarnowet al, Macimilan Publishing Company; New York.
5. Art and Fashion in Clothing Selection Mc Jimsey and Harriet, Iowa State University Press, Jowa.

LEARNING OUTCOMES :

To acquire knowledge about design basics, elements and principles of design.
To apply the elements and principles of design in textiles.
To learn about textile designing and role of motifs in designing.

COURSE OUTCOMES :

On successful completion of the course, the students will be able to.

CO No.	CO STATEMENT
CO1	know the concept of design and its application
CO 2	apply the principles of designon garment designs
CO 3	understand color systems and theories
CO 4	develop of textile designs by creation of motif
CO 5	apply the design concepts for specific body types

MAPPING OF COS WITH POS & PSOS:

CO/ PO	PSO 1	PSO 2	PSO 3	PSO 4	PSO5
CO1	**3**	**3**	**3**	**2.8**	**3**
CO2	**3**	**3**	**3**	**3**	**3**
CO3	**2.8**	**3**	**3**	**3**	**3**
CO4	**3**	**3**	**3**	**3**	**3**
CO5	**3**	**3**	**2.8**	**3**	**3**

PEDAGOGY

Lecture, Power Point Presentation, Demonstration, Group Discussion, Assignment, Library Visits, Seminars and Oral & Written Revision

I YEAR – II SEMESTER

COURSE CODE 23MHF2C1	Core-IV	T/P	C	H/W
	ADVANCED NUTRITION AND DIETETICS	T	5	6

COURSE OBJECTIVES:

- To enable the students to learn the trends in the area of human nutrition.
- To understand the methods of determining various nutrients.
- To know advances in the field of energy, carbohydrate and lipid and protein nutrition.
- To acquire Knowledge regarding the effect of various diseases on nutritional status and nutrient requirement.
- To understand the modifications in nutrients and dietary requirements for therapeutic condition.
- To Learn recent concepts in dietary management of different diseases.

UNIT NO.	CONTENT	HOURS
UNIT I	**Energy :** Human energy requirements - Components of energy requirements - Factors affecting energy expenditure and requirements - Factors affecting the energy expended in physical activity - Methods of estimation of energy expenditure and requirements. **Carbohydrates:** Metabolic utilization and functions of carbohydrates - Regulation of blood glucose concentration - Glycemic index: Factors affecting GI of foods and GI in chronic diseases - Modification of carbohydrate intake for specific disorder (lactose intolerance and diabetes mellitus). **Dietary fiber:** Components of dietary fiber - Physiological effects of dietary fiber - Potential health benefits of dietary fiber- Recommended intake of dietary fiber.	15
UNIT II	**Proteins:** Functions of protein - Improvement of protein quality in diet - Methods of estimating and assessing protein requirements at different stages of life cycle - Deriving Nutritional requirements and recommended dietary allowances for different age groups. **Lipids:** Transport and storage of fats in the body - Functions of fats and oils - Essential fatty acids - Tran's fatty acids - Role of omega 3 and omega 6 fatty acids. Lipoproteins – classification and their importance - Driving nutritional requirements of fats and oils for different age groups. Role of Vitamins and Minerals in day to life. **Water – Sources, Function, Requirement,** Distribution of water in the body and Factors influencing distribution of body fluid. Exchange of water in the body. Water imbalance – dehydration- water intoxication, water and electrolyte mechanism – ADH.	20
UNIT III	**Basic Concepts of Diet Therapy** – Therapeutic adaptations of Normal diet, Principles and classification of therapeutic diets. Routine Hospital diets – Regular, soft, fluid diet. **Nutritional Support Systems:** Enteral and Parenteral Nutrition support- Types, composition and complications. **Nutritional Management on Weight imbalance** - prevalence and classification. **Underweight, Obesity and other Disorders:** Etiology, classification, clinical manifestation, energy balance,	20

	management of Obesity : Components & regulation of Body Weight, Types & causes of Obesity, Nutritional Management, Nutrition post Bariatric Surgery Etiology, clinical manifestation and Dietary management of Underweight, Hyper and Hypothyroidism Classification, hydration calculation, dietary management in Burns, AIDS, Dysphagia, Stroke, Gout, Anaemia, Fever. **Medical Nutrition therapy for Pulmonary Disease** - Effect of Malnutrition on pulmonary system, effect of pulmonary disease on nutritional status, chronic pulmonary diseases- Asthma, cystic fibrosis, chronic obstructive pulmonary disease, Tuberculosis and Pneumonia- Pathophysiology and dietary management.	
UNIT IV	**Medical Nutrition Therapy for Gastrointestinal and Liver Disorders -** Upper Gastrointestinal Diseases – Nutritional care and diet therapy in Diseases of oesophagus - Oesophagitis, Gastro esophageal reflux disease [GERD] and Hiatus hernia. **Disorders of Stomach:** Indigestion, Gastritis, Gastric and duodenal ulcers, and dumping syndrome **Lower Gastrointestinal Diseases** - Common Symptoms of Intestinal dysfunction - Flatulence, constipation, haemorhoids, diarrhoea, steatorrhoea, **Diseases of the Large Intestine** - Diverticular disease, Irritable bowel syndrome, inflammatory bowel disease. **Diseases of Small Intestine** - Celiac disease, tropical sprue, intestinal brush border enzyme deficiencies. **Diseases of the Liver** - hepatitis, hepatic coma, cirrhosis,cholecystits, cholelithiasis and pancreatitis, Zollinger Ellison syndrome and Biliary dyskinesia.	**15**
UNIT V	**Medical Nutrition therapy for Rheumatic Disease** - Etiology, Pathophysiology of Inflammation of Rheumatic diseases, Rheumatoid Arthritis, Osteoarthritis and sjogren syndrome. **Nutritional Management in Metabolic Disorders** - Prevalence, Etiology, risk factors, complications and dietary modifications of diabetes mellitus. **Nutritional Management of Cardiovascular Diseases** - etiology, risk factors, clinical features and dietary modifications of Dyslipidemias, Atherosclerosis, Hypertension, Ischemic heart disease, Congestive cardiac failure. **Nutrition Management of Renal Disease** - Etiology, Clinical and metabolic manifestations, Diagnostic tests, Types - Glomerulonephritis, Nephrotic syndrome, Renal Failure: Acute and chronic, ESRD, Nephrolithiasis and Dietary modifications. **Nutritional Management in Cancer** - Pathogenesis and progression of cancer, types, Symptoms and Dietary management.	**20**
	Total	**90**

BOOKS FOR REFERENCE:

1. Bamji, M.S. Rao, N.P. Reddy. V (2003). **Textbook of Human Nutrition,** 2nd Edition New Delhi : Oxford & IBH Publishing co. Pvt. Ltd.

2. Martin Eastwood, (2003). **Principles of Human Nutrition,** New York : Blackwell Wiley Publishing.
3. Mirande Lomer, (2014). **Advanced Nutrition and Diet in Gastro Enterology,** ISBN : 97811118872796.
4. Sareen S. Gropper and Lack L. Smith (2013). **Advanced Nutrition and Human Metabolism,** USA : Wardsworth Publishing.
5. Garrow JS, James WPT, Ralph A. (2000). **Human Nutrition and Dietetics.** Churchill Livingstone, NY. 10th edition.
6. Groff L James, Gropper S Sareen.(2000). Advanced Nutrition and Human Metabolism. West / Wadsworth, UK. 3rd edition.
7. Sue Rodwell Williams. (1993). **Nutrition and Diet Therapy.** W.B. Saunders Company London. 7th edition.
8. Whitney, E. N. and C. B..Cataldo. (1983). **Understanding Normal and Clinical Nutrition.** West Pub. S1. Paul.

TEXT BOOKS:

1. Mahan L.K., Sylvia Escott-Stump. (2000). Krause‟s Food Nutrition and Diet Therapy. W.B. Saunders Company London. 10th edition.
2. Srilakshmi B. (2007). **Dietetics.** K.K. Gupta For New age International Pvt. Ltd. New Delhi Publisher.
3. Antia F.P. And Philip Abraham. (2001). **Clinical Nutrition and Dietetics.** Oxford Publishing Company.
4. Passmore P. And M.A. East Wood. (Digitised in 2010). **Human Nutrition And Dietetics.** Churchill Living Stone.
5. Mudambi S.R. and Rajagopal M.K. (2009). **Fundamentals, Food Nutrition and Diet Therapy.** New Age Publishers. 5th edition.
6. Robinson Ch., M.B. Lawlea, W.L., Chenoweth, And A.E., Carwick. (1990). **Basic Nutrition and Diet Therapy,** Macmillan Publishing Company.

E-LEARNING RESOURCES:

1. www.nutrition.gov - Service of National agricultural library, USDA.
2. www.nal.usda.gov/fnic -Food and Nutrition information centre.
3. www.healthyeating.org.
4. www.eatrightpro.org.
5. https://www.globalhealthlearning.org.

COURSE OUTCOME:

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

CO No.	CO Statement
CO1	Know the concept of different nutrients' functions and its importance in dietary management
CO2	Comprehend the current concepts of therapeutic diets and critically ill
CO3	Implement the dietary principles on various disorders.
CO4	Acquire the knowledge of diet counseling skills.
CO5	Apply the dietary principles to manage the lifestyle disorders in the society

Mapping of Co with PSO:

CO/PSO	PSO 1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	3	1	2
CO2	2	3	3	3	1	2
CO3	3	3	3	3	1	3
CO4	2	3	3	3	1	2
CO5	3	3	3	3	1	3
Average	2.6	3	2.8	3	1	2.4

PEDAGOGY

Lecture, journal reviewing, Assignments, Power point presentations, video presentations.

I YEAR – II SEMESTER

COURSE CODE 23MHF2P1	Core-V	T/P	C	H/W
	ADVANCED NUTRITION AND DIETETICS - PRACTICAL	P	5	6

COURSE OBJECTIVES:

1. To acquire Knowledge in planning diets for various disorders,
2. To gain knowledge in diet counselling and educating patients.
3. To understand the therapeutic modifications of diet.

PRACTICAL EXERCISES :

1. Routine hospital diet : Regular diet, Clear liquid, Soft diet, Full liquid diet and Planning and preparing Enteral feed plan [8hrs].
2. Assessing requirements and planning diet for obese and underweight individual [6hrs]
3. Planning and preparing diet for Diabetes Mellitus [IDDM and NIDDM] [6hrs].
4. Planning and preparation of diet for Atherosclerosis with hypertension [6hrs]
5. Assessing and planning diets for the following conditions [13hrs]
    a. Celiac disease
    b. Lactose intolerance.
    c. GERD
    d. Peptic ulcer
    e. Hepatitis
    f. Cirrhosis
6. Planning and preparing diet for Pneumonia [6hrs]
7. Planning and preparing diet for Rheumatic arthritis [6hrs]
8. Planning and preparation of diet for Glomerulonephritis [6hrs]
9. Planning and preparation of diet for cancer according to the condition. [6hr]
10. Planning and Preparation of diet for pre and post Bariatric surgery patients. [6hrs]
11. Assessment and planning diet for post burn condition [6hrs].

TEXT BOOKS :

1. Stump SE. (2012). **Nutrition and Diagnosis Related Care.** Lippincott Williams and Wilkins. Canada.7th edition.
2. Width.M and Reinhardt T. (2018). **The Essential Pocket Guide for Clinical Nutrition.** Wolters Kluwer Publishers. 2nd edition.
3. Whitney EN and Rolfes S.R. (2002). **Understanding Nutrition,** 9th edition, West/Wordsworth.
4. Guthrie H (2002). **Introductory Nutrition.** CV Mosby Co. St. Louis.
5. Elia M, Ljunggvist O, Stratton RJ, Lanham SA. (2013). **Clinical Nutrition.** The Nutrition Society Textbook. Wiley Blackwell Publishers. 2nd edition.
6. Mitch, W. and Ikizler, Alp. (2010). **Handbook of Nutrition and the Kidney.** Lippincott Williams and Wilkins, New Delhi.6th edition.
7. Mahan LK, Stump SE and Raymond JL. (2012). **Krause's Food and Nutrition Care Process.** Elsevier Saunders.Missouri.13th edition.

REFERENCES:

1. Gopalan C., Ram Sastri B.V. And BalSubramaniam S.C. (2006). **Nutritive Value of Indian Foods.** Hydrabad, National Institute of Nutrition. Indian Council of Medical Research.
2. Clinical Dietetics Manual. (2018). Indian Dietetic Association. 2nd edition.
3. Peggy Stanfield. Y.H. Hui. (2010). **Nutrition and Diet Therapy.** Jones and Bartlett publishers.
4. William's. (2012). **Basic Nutrition and Diet Therapy.** 14th Edition.

E-LEARNING RESOURCES:

1. www.nutrition.gov - Service of National agricultural library, USDA.
2. www.nal.usda.gov/fnic -Food and Nutrition information centre. www.healthyeating.org.
3. www.eatrightpro.org.
4. https://www.globalhealthlearning.org.

COURSE OUTCOME:

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

CO No.	CO Statement
CO1	Evaluate various therapeutic diets
CO2	Identify the requirements for disease conditions and critically ill patients.
CO3	Assess and plan the diets for various disease conditions.
CO4	Create Knowledge in nutrient calculations and dietary principles.
CO5	Design the personalized diets for different individuals in the society

Mapping: (CO/PSO)

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	3	3	3	1	2
CO2	3	3	3	3	1	3
CO3	3	2	3	3	2	3
CO4	3	2	3	3	3	2
CO5	3	3	3	3	3	3
Average	**2.8**	**2.6**	**3**	**3**	**2**	**2.6**

PEDAGOGY: Group Discussion, Case study, Assignments, Planning menus in charts.

I YEAR – II SEMESTER

COURSE CODE 23MHF2C2	Core-VI	T/P	C	H/W
	ADVANCES IN TEXTILES AND CLOTHING	T	4	6

COURSE OBJECTIVES:

1. Recognize natural and artificial fibres and their properties
2. Understand the various yarns, spinning methods and weaves
3. Know about the fabric construction and their finishing
4. identify with the garment components and sewing techniques
5. Be aware of the current process and trends, new developments and technologies in the field of textiles and apparel

UNIT NO.	CONTENT	HOURS
UNIT I	**Textile Terminologies:** Fibre, yarn, weave, fabric – classification of fibres and manufacturing process of all fibres (natural and man-made fibres), its properties, identification of textile fibres with their microscopic structure and its end uses. **Spinning** – Definition, Classification- Mechanical and chemical process. Yarn– definition, classification – simple and fancy yarns / novelty / decorative yarns.	15
UNIT II	**Different Methods of Fabric Construction: Weaves** – weaving mechanism, Parts of a loom and basic process, basic weaves and Fancy weaves .Woven, knitted and non woven fabrics, their properties and uses. **Textile finishes**: Classification, processing and purposes of finishes **Dyeing and Printing:** Classification, methods and their merits and demerits.	20
UNIT III	**Body Measurements –** Procedure, need, figure types and anthropometry. **Equipments and tools used for manufacturing garments** – advancements and attachments used for sewing machine. Types of machine and their parts **Pattern making –** Drafting, draping and flat pattern making techniques, pattern alteration and drat manipulation techniques.	20
UNIT IV	**Care and Maintenance of clothing** – principles of washing**,** laundry agents, storage techniques case labels and symbols, selection of clothing for different age groups. **Pressing Equipments** – purpose, pressing equipment's and methods – iron, steam press, steam air finisher, steam tunnel.	15
UNIT V	**Textile and Environment –** Banned dyes, Eco-friendly textiles, contamination and effluent treatment, Eco- label and eco- marks. **Recent Developments in textiles and Apparels** – nano textiles, technical textiles, occupational clothing ,zero waste designing, up cycling and recycling.	20
	Total	90

REFERENCES

1. Rastogi. D and Chopra. S., (2017). **Textile Science,** Hyderabad: Orient Black-Swan Private Limited.
2. Corbman. B.P., (2005). **Textiles Fiber to Fabric,** (Sixth edition). New Delhi: McGraw Hill International Editions.

3. Kaplan, N.S., (2008). **Textile Fibres,** Chandigarh: Abhishek Publications.
4. Corbman B.P., and Potter.M.D., (1984).**Textiles fiber to fabric**, New York: International Edition, Mc Graw-hill book Co,
5. Pretal.J.J., (1990). **Fabric Science,** (5th edition), New York: Fairchild Publications.
6. Mathews. M., (1896). **Practical's Clothing Construction Part I & II,** Chennai: Cosmic Press.
7. Joseph.H., (2000). **Pattern Making for Fashion Design,** New Dehi: Armstrong Pearson Education.

COURSE OUTCOME:

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

CO No.	CO Statement
CO1	Learn Textile terminologies, manufacturing process of all fibres and its properties, identification of textile fibres
CO2	Identify the Different Methods of Fabric Construction and their properties, types of finishes and classification of dyeing and printing
CO3	Understand the Equipments and tools used for manufacturing garments and pattern making
CO4	Create Knowledge on Care and maintenance of clothing, selection of clothing for different age groups.
CO5	Gain knowledge on Textile and Environment, Recent Developments in textiles and Apparels – nano textiles and technical textiles

E-LEARNING RESOURCES :

Mapping of CO with PSO:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO4	PSO 5	PSO 6
CO1	3	3	2	1	1	3
CO2	3	3	2	1	1	3
CO3	3	3	2	1	1	3
CO4	3	3	2	1	1	3
CO5	3	3	3	1	1	3
Average	**3**	**3**	**2.2**	**1**	**1**	**3**

PEDAGOGY :

Group Discussion, Case Study, Seminar, Journal Reviewing, Assignments, Power point presentations.

I YEAR – II SEMESTER

COURSE CODE 23MHF2E1	DSE-III-A	T/P	C	H/W
	NUTRITIONAL BIOCHEMISTRY	T	3	4

COURSE OBJECTIVES

1. Understand the need for the study of biochemistry as the basis for nutritional sciences.
2. Make students aware of metabolism of proximate principles and others.
3. A basic understanding of the functions of biological systems in relation to Nutritional biochemistry.

UNIT NO.	CONTENT	HOURS
UNIT I	Biological oxidation and enzymes - biological oxidation, Electron transport chain and Oxidative Phosphorylation. Enzymes - Definition, Types, mechanism of action, factors affecting enzyme activity, coenzyme, role of b vitamin as coenzyme. Free radicals – definition, formation in biological systems. Antioxidants – definition, Role of antioxidants in prevention of degenerative disorders.	20
UNIT II	Metabolism of Carbohydrates: Glycolysis, The Citric Acid Cycleglycogenesis, glycogenolysis, gluconeogenesis, The Hexose Monophosphate Shunt and bioenergetics. Hormonal regulations of blood glucose homeostasis.	15
UNIT III	Protein and amino acid metabolism - Classification of amino acids, Oxidative Deamination, decarboxylation, transamination and transmethylation of amino acids, urea cycle, biosynthesis of non-essential amino acids, catabolism of essential amino acids. Protein biosynthesis.	20
UNIT IV	Metabolism of Lipids - Classification of fatty acid, Biosynthesis of fatty acids, beta oxidation of fatty acids and ketone bodies. Essential fatty acids – types and functions. Metabolism of phospholipids, and cholesterol. Lipo proteins – classification and function.	15
UNIT V	Overview of intermediary metabolism of carbohydrates, protein and lipid. Hormonal regulation of carbohydrate protein and fat metabolism Structural components and functions of nucleic acid, Structure of DNA, DNA Replication, RNA synthesis – types and functions and metabolism, translation. Recombinant DNA technology, Metabolism of Xenobiotics, Nutrigenomics.	20
	Total	**90**

TEXT BOOKS

1. Jain, J.L., Jain, S., & Jain, N., (2005). Fundamentals of Biochemistry. S. CHAND & COMPANY Ltd. Ram nagar, New Delhi-110 055. 6th revised edition.
2. Bettelheim, F. A., Brown, W. H., Campbell, M. K., & Farrell, S. O. (2009). *General, Organic & Biochemistry*. Brooks/Cole Cengage Learning.
3. Champe, P. C., Harvey, R. A., & Ferrier, D. R. (2005). *Biochemistry*. Lippincott Williams & Wilkins, 6th Edition, Wolters Kluwer, London.
4. Talwar, G. P., & Srivastava, L. M. (2002). *Textbook of biochemistry and human biology*. PHI Learning Pvt. Ltd..
5. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2000): 25th Ed. Harpers Biochemistry.Macmillan worth publishers.

REFERENCE BOOKS

1. Marshall, W. J., Lapsley, M., Day, A., &Ayling, R. (2014). Clinical Biochemistry E-Book: Metabolic and Clinical Aspects. Elsevier Health Sciences.
2. Bender, D. A. (2003). Nutritional biochemistry of the vitamins. Cambridge university press.
3. Albanese, A. (Ed.). (2012). Newer methods of nutritional biochemistry V3: With applications and interpretations. Elsevier.
4. Champe, P. C., Harvey, R. A., & Ferrier, D. R. (2005). Biochemistry. Lippincott Williams & Wilkins.
5. Lieberman, M., & Ricer, R. E. (2009). Lippincott's Illustrated Q&A Review of Biochemistry. Lippincott Williams & Wilkins.

E-LEARNING RESOURCES :

1. https://www.classcentral.com/course/swayabiochemistry-5229
2. https://www.classcentral.com/course/edx-biochemistry-biomolecules-metho ds-and-mechanisms-12585
3. https://www.classcentral.com/course/swayam-experimental-biochemistry-12 909
4. https://youtu.be/y6YGZfcAegw

COURSE OUTCOME:

On completion of the course the students will be able to…

CO No.	CO Statement
CO1	Understand the role of enzymes and co enzymes in biological oxidation.
CO2	Gain knowledge on metabolism and regulation of carbohydrate.
CO3	Understand the concept of metabolism and bioenergetics of lipids.
CO4	Discuss the classification, structure, organization and metabolic pathway of protein.
CO5	Comprehend the biological metabolism and functions of nucleic acid and understand recent concepts in biochemistry.

Mapping of CO with PSO:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO4	PSO 5	PSO 6
CO1	3	3	2	1	1	3
CO2	3	3	2	1	1	3
CO3	3	3	2	1	1	3
CO4	3	3	2	1	1	3
CO5	3	3	3	1	1	3
Average	**3**	**3**	**2.2**	**1**	**1**	**3**

PEDAGOGY :

Group Discussion, Case Study, Seminar, Journal Reviewing, Assignments, Power point presentations.

I YEAR – II SEMESTER

COURSE CODE 23MHF2E2	DSE-III-B	T/P	C	H/W
	FOOD PRODUCT DEVELOPMENT	T	3	4

COURSE OBJECTIVES

To enable the students o

1. Understand and gain experience in the process of food product development
2. Gain knowledge related to the consumer in product development
3. Gain insight into food product ingredient technology

UNIT NO.	CONTENT	HOURS
UNIT I	**INTRODUCTION TO NEW FOOD PRODUCT DEVELOPMENT** Definition, significance of product development, food needs and consumer preferences, market survey and designing a questionnaire to find consumer needs for a product. Steps involved in product development, formulation of nutritious food products and standardization, Factors that influence new product development success, Intellectual Property Rights and patenting of foods.	15
UNIT II	**SENSORY EVALUATION OF THE PRODUCT** Assessing the sensory characteristics of food - colour, texture, harma, odor and taste. Sensory evaluation of foods – Laboratory set up, equipment, panel selection and training, judging quality. Subjective evaluation techniques – Difference tests: paired comparison test, duo-trio test, triangle test. Rating tests – Ranking single sample, two samples and multiple samples. Objective tests to assess the sensory properties of foods.	20
UNIT III	**ESSENTIALS OF FOOD PACKAGING** Importance, definition, principles design requirement and basic FSSAI laws governing food packaging. Selection criteria and types of packaging material – metal, glass, paper, plastic, edible, wooden. Packages with special features – Boil-in-bag package, plastic-shrink package, cryovac film, microwave oven packaging, aseptic packaging and distribution packaging.	20
UNIT IV	**PRODUCT LABELLING AND REGULATIONS** Definition, purpose, importance, Function, Nutritional information and laws governing product labelling. Types of labelling – smart labels, barcode labels, radioactive labels, antimicrobial labels, security labels and other specialized food labels. Standards and regulations for nutrition harming and Nutrition claims in food labels.	15
UNIT V	**QUALITY CONTROL, PRICING AND MARKETING** Analyzing the product stability, evaluation of shelf life, determining the changes in sensory attributes due to environmental conditions. Pricing a product, Methods of pricing-cost plus pricing, Demand pricing, Competitive pricing, mark up pricing, Principles of pricing, determining the selling price and profit margin, price bundling, promotional pricing and quantity discounts. Advertising and marketing strategies - Basic techniques, Food advertising regulations, Marketing mix “four P’s”.	20
	TOTAL	**90**

ACTIVITY

Conduct a market survey and develop a new food product based on the needs of your target audience. Conduct sensory analysis tests for the formulated product. Identify a suitable packaging material and design a label for your product. Determine the selling price and devise any two marketing strategies to promote your product.

TEXTBOOKS:

1. Reddy S M. (2003). **Basic Food Science and Technology**. New Age Publisher, 1st edition.
2. Subbulakshmi G. and Udipi A. Shobha (2017). **Food Processing and Preservation**. New Age Publisher. 1st edition.
3. Manay S. And Shadaksharamasamy (2009). **Food: Facts and Principles.** New Age International (P) Publishers, New Delhi: 1stedition.
4. Avantina Sharma (2017). **Text Book of Food Science and Technology.** CBSOU Publisheres and distributes Ltd. 3rdedition.

REFERENCES:

1. Lyon D.H. and Francombe M.A. and Hasdell T.A. Lawson (2002). **Guidelines for Sensory Analysis in Food Products Development and Quality Control.** Chepman and Hall London. 1st edition.
2. Fuller G.W. (1994). **New Food Product Development from Concept to Market Place.** RC Press New York. 2ndedition .
3. Man C.M.D. and Jones A.A. (1994). **Shelf Life Evaluation of Foods.** Blackie Academic and Professional London. 2nd edition.
4. Frewer L. and Van Trijp H. (2007). **Understanding Consumers of Food Products.** Florida USACRC Press.1st edition.

E - RESOURCES

1. https://www.fssai.gov.in/
2. https://nzifst.org.nz/resources/foodproductdevelopment
3. https://nzifst.org.nz/resources/foodproductdevelopment/Chapter-3-1-2.htm
4. https://www.fssai.gov.in/
5. https://theintactone.com/2019/07/23/im-u3-topic-3-packaging-and-labelling/

COURSEOUTCOME

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

CO No.	CO STATEMENT
CO1	Consider the role of food trends in the development of new products.
CO2	Create a food product using knowledge of food ingredients and functional foods.
CO3	Create and assess a product using the development process.
CO4	Analyse and evaluate the design and packaging for food products. Assess the product's quality and sensory characteristics.
CO5	Describe the marketing innovation strategies to be used to produce new innovative food products.

Mapping: (CO/PSO)

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	2	3	3
CO2	3	2	3	3	3	2
CO3	3	3	3	3	3	3
CO4	3	3	2	3	2	3
CO5	3	3	3	2	3	3
Average	**3**	**2.8**	**2.8**	**2.6**	**2.8**	**2.8**

PEDAGOGY

Lecture, journal reviewing, Project work, Group discussion, Power point presentations, Field visit.

I YEAR – II SEMESTER

COURSE CODE 23MHF2E3	DSE-IV-A	T/P	C	H/W
	FOOD SAFETY AND QUALITY CONTROL	T	3	4

COURSE OBJECTIVES

To understand the importance of food safety and quality,

1. To familiarize with different quality assurance systems followed in the food industry,
2. To infer the various food quality management systems and quality norms of FSSAI and
3. To take part in sensory analysis of food.

UNIT NO.	CONTENT	HOURS
UNIT I	**Food Safety** – Meaning, Food Safety and its safety, Concerns, Importance of Safe Food, Factors affecting Food Safety, Threats to safety of Food Supply, Packaging Materials as a threat, Current Challenges to Food Safety, Toxins in Food – Toxicants in Animal Food, Plant Food, Environmental Toxins.	15
UNIT II	**Quality Control** – Meaning, Concepts of Food Quality, Importance, Functions of Quality Control, Stages of Quality Control in Food Industry, Methods of Quality Assessment of Food Materials -Fruits, Vegetables, Cereals, Dairy, Meat, Poultry, Egg, Processed Food Products. **Food Quality Assurance:** Total Quality Management (TQM) Meaning, Concepts, Need, Components, GMP, HACCP – History, Meaning, Principle, Guidelines for Application of HACCP.	25
UNIT III	**Food Laws and Regulations** – History of Regulations in India, FAO, WHO, CODEX Alimentarius, CODEX India, BIS, AGMARK, Consumer Protection Act, FSSAI, PFA, Essential Commodities Act, Standards of Weight and Measures Act, Export Act, FPO, ISO 22000, ISO 9000 Series, HALAL.	15
UNIT IV	**Food Quality Indices** – Meat and Meat Products, Fish and Fish Products, Milk and Dairy Products, Vegetables, Fruits and their Products, Grains, Pulses and Oil Seeds Coffee Tea and Spices Food Adulteration: Definition, Nature of Adulterants, Methods of Evaluation of Food Adulterants and Toxic Constituents. Additives : Meaning, Classification, Types of Additives.	20
UNIT V	Role of Central and State Govt. in Imparting Quality Control, WHO assisted Activities, Role of Central Food Laboratory and State Food Laboratories, Qualification and Duties of Public Analyst and Food Inspector.	15
	TOTAL	90

Text Books:

1. Thomas Ohlsson, Nils Bengtson, Minimal Processing Technologies in the Food Industry - Business & Economics,2002.
2. Gustavo V. Barbosa-Canovas, Maria S. Tapia, M. Pilar Cano, Technology & Engineering,2004.

Books for Reference:

1. Sivasankar B, Food processing and preservation. Asoke K.Ghosh publication, New Delhi, Third edition, 2005.
2. P. J. Fellows , Food Processing Technology: Principles and Practice, Third Edition, Wood head publication, 2009.
3. Arthey D and Ashurst P R ,Fruit Processing, Blackie Academic & Professional, London,1996.
4. Venkataiah S.D, (2004), Nutrition Education, Anmol Publication Pvt, Ltd.
5. A Lesties Banks and Hislop J.A., Health and Hygiene - Universal Tutorial Press, London.
6. Wal Ruchi Mishra,S, (2000), Encyclopedia of Health Nutrition and family welfare, published by Sarup and sons, New Delhi.
7. Srilakshmi, B, (2002), Nutrition Science, New Age International [p] ltd, New Delhi,
8. Swaminathan, M, 2003, Handbook of Food and Nutrition, Fifth Edition, the Bangalore Printing and Publishing Co.Ltd.
9. Mahtab S,Bamji, Prasad Rao, N.Vinodini Reddy, (2003),Textbook of Human Nutrition, Second Edition, Oxford and IBH Publishing Co. Pvt .Ltd.
10. Park & Park, (2000). Park's Textbook of Preventive and social medicine, 18th edition, M/S Banarasids Bhanot, Jabalpur
11. R. C. Mishra, (2005), Health and Nutrition Education, A. P.H. Publishing Corporation, New Delhi.

E- RESOURCES :

1. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000015FT/P000043/M000082/ET/1500370047M-02.pdf
2. https://egyankosh.ac.in/bitstream/123456789/61874/1/UNIT%201%20Introduction%20to%20Food%20Microbiology%20Microbiology.pdf

COURSEOUTCOME

On successful completion of the course the student will be able to

CO NO.	CO STATEMENT
CO1	Understand the Scope of food safety.
CO2	Understand and choose suitable techniques for enumeration of microbes and methods (traditional to advanced) for preserving food.
CO3	Describe the role of different microorganisms in food spoilage, food fermentation and food-borne diseases and suggest ways to prevent food spoilage and food borne diseases.
CO4	Evaluate and recommend methods for microbiological quality control. Create investigation procedures for ensuring food safety & Hygiene.
CO5	Remember the food safety rules and regulations, Comprehend the use of Food Safety Management System (FSMS), and conduct Microbiological Risk Assessment.

MAPPING OF CO WITH PSO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	2	3	3
CO2	3	2	3	3	3	2
CO3	3	3	3	3	3	3
CO4	3	3	2	3	2	3
CO5	3	3	3	2	3	3
Average	**3**	**2.8**	**2.8**	**2.6**	**2.8**	**2.8**

PEDAGOGY

Lecture, journal reviewing, Project work, Group discussion, Power point presentations, Field visit.

I YEAR – II SEMESTER

COURSE CODE 23MHF2E4	DSE-IV-B	T/P	C	H/W
	GUIDANCE AND COUNSELLING	T	3	4

COURSE OBJECTIVES

To enable the students

1. to understand the basic concepts of counseling,
2. to develop on insight into the counseling process,
3. to gain skills in counseling and
4. to equip him/her as a professional counselor

UNIT NO.	CONTENT	HOURS
UNIT I	**Guidance and Counseling** – Meaning, Nature, Scope, Principles, Goals, Needs of Guidance and Counseling of different groups, Relationship between guidance and counseling. **Types and Techniques used in Guidance** – Educational, Vocational, Socio-personal, Leisure time guidance; Individual and Group Guidance – Meaning and needs, Advantages, Techniques used; Role of audio-visual aids in guidance.	15
UNIT II	**Counselors** – Characteristics, Qualification and qualities, Skills and Competencies; Ethics – Do's and Don'ts; Limitations and Professional growth of counselors; Tips for becoming effective counselors. Counseling Process – Preparation and Pre requisites for counseling stages in counseling process Follow up and Review.	20
UNIT III	**Counseling Approaches and Techniques** – Meaning, Origin, Procedure, Merit and Limitations of counseling approaches; Psychoanalysis approach, Carl Roger's approach, Rational– Emotive approach; Counseling techniques – Client-centered, Counselor-centered and Eclectic counseling. **Types of Counseling** - Individual and Group counseling - Tools Required, Types of groups, Process of individual and Group counseling, Merits and Limitations – Situations that lend for group counseling situation.	20
UNIT IV	**Areas of Counseling** – Premarital and Marital counseling, Family counseling, Parental counseling, Adolescent counseling, Counseling for girls and children belonging to special groups **Special Concerns of School Counselor** – Issues related to academic achievement, School dropout, Child abuse, Sexual abuse, Substance abuse, Family relations and child's right.	20
UNIT V	Guidance Strategies for Social and Personal Problems Developing self-confidence, Assertive training, Improving communication skills, Mental and Physical Methods of Relaxation; Self-improving Programmes : study skills training, Problem Solving Techniques, Managing Motivation, Time Management, Remedies for Procrastination, Decision Making.	15
	TOTAL	90

BOOKS FOR REFERENCE:

1. Publication. Stanley B. Baker & Edwin R. Gerler, Jr. (2004) School Counselling for the Twenty First Century. 4th Edition, New Jersey, Pearson Education
2. Text book of Rehabilitation – 2nd Edition S.Sunder, Jaypee Brothers, New Delhi, 2002.

3. Sage Colin Felthman and Ian Horton (2000) (Ed), Handbook of Counseling and Psychotherapy, New Delhi: Sage
4. Gibson L Robert and Mitchel H Marianne (2003), Introduction to Counseling and Guidance, Pearson education, Inc
5. Sharma R N and Sharma R (2004), Guidance and Counseling in India.
6. Anastasi Anne & Urbina, Susana (1997) Psychological Testing 7th Ed Indian reprint 2002 Pearson Education, Inc
7. Asch M (2000) Principles of guidance and counseling 1st ed New Delhi: Sarup & Sons Bowe Frank G (2000) Birth to five – early Childhood special education, New York Delmar Publishers Inc.

COURSE OUTCOME

On successful completion of the course the student will be able to

CO NO.	CO STATEMENT
CO1	Understand the principles and needs of guidance and counselling.
CO2	Understand the qualities and competencies of a counselor. Know about the counseling process.
CO3	Describe the Counseling Approaches and Techniques and Types of Counseling.
CO4	Know the Areas of Counseling and Special Concerns of School Counselor – Issues related to academic achievement.
CO5	Remember the Guidance Strategies for Social and Personal Problems Developing self-confidence.

MAPPING OF CO WITH PSO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	2	3	3
CO2	3	2	3	3	3	2
CO3	3	3	3	3	3	3
CO4	3	3	2	3	2	3
CO5	3	3	3	2	3	3
Average	**3**	**2.8**	**2.8**	**2.6**	**2.8**	**2.8**

PEDAGOGY

Lecture, journal reviewing, Project work, Group discussion, Power point presentations, Field visit.

I YEAR – II SEMESTER

COURSE CODE 23MHF2S1	SEC-I A	T/P	C	H/W
	FOOD PRESERVATION	T	2	4

COURSE OBJECTIVES :

To enable students to

1. Learn the basic concepts and importance of Food Preservation
2. Understand the different methods of Food Preservation
3. Choose appropriate food handling and storage techniques

UNIT NO.	CONTENT	HOURS
UNIT I	**Introduction to Food Preservation** a. Concept, importance of food preservation. b. Common terms used in food preservation. c. Classification of food on the basis of storage, Ph value, moisture content. d. Different methods and Principles of preservation.	15
UNIT II	**Preservation by Low Temperature** a. Use of Cold and Refrigerated Storage. b. Use of Freezing temperatures: Slow and fast freezing of foods and Cryogenic freezing of foods, dehydro freezing c. Frozen storage and thawing of foods	20
UNIT III	**Preservation by High Temperature** a. Preservation of foods by high temperatures: Basic concepts in thermal destruction of microorganisms- Heat resistant and thermophilic microorganisms. b. Cooking, Blanching, Pasteurization and Sterilization of foods. c. General process of caning of foods d. Spoilage in canned foods.	20
UNIT IV	**Preservation by Drying** a. Principles and application of drying and dehydration of foods b. Different types of drying and dryers. c. Treatments prior to drying d. Freeze drying of foods.	20
UNIT V	**Preservation by Preservatives** a. Types of preservatives Natural and Artificial: Mode of action of different preservatives b. Preservation by ionizing radiations, fermentation, curing, pickling, smoking. c. Application of traditional and modern food preservation techniques.	15
	TOTAL	90

REFERENCE BOOKS

1. Prakash Triveni (2010). **Food Preservation.** Aadi Publication, New Delhi.
2. Shafiur Rahman M. (2007). **Hand Book of Food Preservation.** Marcel Dekker Inc, New york..McWillims and Paine (2009) : Modern Food Preservation, Surjeet Publications.
3. Karnal, Marcus and D.B. Lund (2003). **Physical Principles of Food Preservation**. Rutledge.
4. Van Garde,S.J. and Woodburn M. (2001). **Food Preservation and Safety Principles and Practice**. Surbhi Publications.
5. Sivasankar, B. (2002). **Food Processing & Preservation.** Prentice Hall of India
6. Khetarpaul, Neelam (2005). **Food Processing and Preservation.** Daya Publications.
7. Norman N. Potter, Joseph H. Hotchkiss: **Food Science,** 5th ed.New York : Chapman & Hall.

E-LEARNING RESOURCES

1. https:// www.embibe .com/food -preservation/
2. https://agripathshala.com/lessons/principles-of-food-preservation
3. www.onlinebiologynotes.com/food-preservation-from-microbial-spoilage-principles
4. https://www.researchgate.net/publication/347909697_FOOD_PRESERVATION

COURSE OUTCOME

On successful completion of the course the student will be able to

CO NO.	CO STATEMENT
CO1	Describe the basic concepts and principles of Food Preservation.
CO2	Identify the best methods of storage of different foods based on their shelf life. Recommend appropriate postharvest technology procedures that increase shelf life of food.
CO3	Analyze the use of low and high temperature to preserve food and identify the appropriate method to preserve different foods
CO4	Discuss the use and effects of different preservatives on the quality of foods.
CO5	Appreciate the use of modern technology in food preservation and managing food wastage.

Mapping of Co with PSO:

CO/PSO	PSO 1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	3	1	2
CO2	2	3	3	3	1	2
CO3	3	3	3	3	1	3
CO4	2	3	3	3	1	2
CO5	3	3	3	3	1	3
Average	2.6	3	2.8	3	1	2.4

PEDAGOGY

Lecture, journal reviewing, Assignments, Power point presentations, video presentations.

I YEAR – II SEMESTER

COURSE CODE 23MHF2S2	SEC-I B	T/P	C	H/W
	MATERNAL NUTRITION	T	2	4

COURSE OBJECTIVES

1. To understand the physiological changes in pregnancy and lactation.
2. To understand the inter-relationship between nutrition and growth and development during this period.

UNIT NO.	CONTENT	HOURS
UNIT I	**Importance of Maternal Nutrition :** Importance of nutrition prior and during Pregnancy. Effect of under-nutriton of mother and child including pregnancy and lacatation. Complications of Pregnancy and its management.	15
UNIT II	**Physiological Changes During Pregnancy:** Nutritional requirement during pregnancy. Physiology and endocrinology of pregnancy and embryonic and fetal growth and development. Intra-uterine growth retardation. Complications of Adolescent pregnancy.	20
UNIT III	**Lactation - P**re and post delivery nutritional care, Nutritional requirements during lactation, Factors affecting breastfeeding. Physiological needs and nutritional support, additional allowances; Advantages and disadvantages of breast Milk.	20
UNIT IV	**Infancy** - Growth pattern of infants, nutritional requirements, Breast milk Vs bottle milk, Importance of Weaning and supplementary foods during Infancy period.	20
UNIT V	**Common Disorders of Pregnancy** – Anaemia, TB, HIV Infusion, Hypertension, Moderate and severe malnutrition.	15
	TOTAL	90

BOOKS FOR REFERENCE:

1. International Food Policy Research Institute (1997). **Care and Nutrition: Concepts and Measurements.** Washington, USA :International Food Research Institute.
2. Barker, D.J.P. (1998). **Mothers, Babies and Health in Later Life.** Edinburgh, Churchill Livingstone.
3. Ward, R.H.T.,Smith, S.K. Donnai, D. (Eds.) (1994). **Early Fetal Growth and Development.** London: RCGD Press.
4. Sachidev, IIPS and Choudhary, P. (1995). **Nutrition in Children Developing Country Concerns.** New Delhi: Cambridge Press.
5. King, F.S. (1992). **Helping Mothers to Brasfeed Association for Consumers Action on Safety and Health.** Mumbai.
6. Wallace, H.M. and Giri, K. (1990). **Health care of Women and Children in Developing Countries.** Oakland: Third Party Publishing Co.
7. Tanner, J.M. (1988). **Foetus into Man: Physical Growth from Conception to Maturity.** Great Britain:. Weaton and Co. Ltd.
8. Luke, B., Johnson, T.R.B., and Petrie, R.H. (1993). **Clinical Maternal Fetal Nutrition.** Boston: Little Brown and Co.
9. WHO. (1999). **Nutrition for Health and Development: Progress and Prospects on the Eve of the 21st Century.** Geneva : WHO / NHD.

10. Alderman, H., Behrman, J., and Lavy., Menon, R. (1997). Child Nutrition, Child Health and School Enrollment. Policy Research Working Paper 1700. Washington DC: World Bank.

E-LEARNING RESOURCES

1. https://www.unicef.org/nutrition/maternal
2. https://www.ncbi.nlm.nih.gov/pmc/articles/
3. https://vikaspedia.in/health/nutrition/dietary-guidelines-1/nutrition-for-pregnant-and-lactating-women
4. https://www.jacarandamaternity.co.ke/post/nutritional-requirements-during-lactation

COURSE OUTCOME

On successful completion of the course the student will be able to

CO NO.	CO STATEMENT
CO1	Describe the Importance of nutrition prior and during Pregnancy.
CO2	Study the Physiology and endocrinology of pregnancy and embryonic and fetal growth and development.
CO3	Identify the Nutritional requirements during lactation, Factors affecting breastfeeding.
CO4	Discuss the Growth pattern of infants and nutritional requirements during Infancy period.
CO5	Understand the Common Disorders of Pregnancy.

Mapping of Co with PSO:

CO/PSO	PSO 1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	3	1	2
CO2	2	3	3	3	1	2
CO3	3	3	3	3	1	3
CO4	2	3	3	3	1	2
CO5	3	3	3	3	1	3
Average	2.6	3	2.8	3	1	2.4

PEDAGOGY

Lecture, journal reviewing, Assignments, Power point presentations, video presentations.

II YEAR – III SEMESTER

COURSE CODE 23MHF3C1	Core-VII	T/P	C	H/W
	RESEARCH METHODOLOGY AND STATISTICS	T	5	6

COURSE OBJECTIVES

1. To provide students understandings about the basic concepts, approaches and methods in conducting research thereby enabling them to appreciate and critique the nuances of designing a research study as well the ethical dimensions of conducting researches.
2. To explain the importance of research in food science and nutrition.
3. To make students understand the types of tools applicable to research problem and develop skills of preparing out line of research work and construct common data collection tools.

UNIT NO.	CONTENT	HOURS
UNIT I	**Foundation of Nutrition Research** 1. Meaning, Objectives and Classification of Research Designs – Exploratory, Descriptive – Longitudinal and Cross sectional, Observation-Participant and Non-participant, Epidemiological Surveillance, Retrospective, IN VIVO, IN VITRO and Experimental – Pre-Experimental, Quasi Experimental, True Experimental and Statistical Experimental designs. 2. Need of Research in Food Science and Nutrition 3. Research Process- ● Selection and Formulation of Research Problem ● Objectives of Research: Explanation, Control and Prediction ● Hypothesis: Definition, Importance, Types and Errors - I & II ● Deciding Variables	15
UNIT II	**Sampling and Sample Design** 1. Sampling Process and Characteristics of good Sampling 2. Classification of Sampling Techniques - Probability and Non Probability Sampling 3. Preparation of Laboratory Food Samples 4. Sampling and Non- Sampling Errors **Measurements and Scaling -** **1. Fundamental and Comparative Scales – Meaning and Types** ● Nominal Scale ● Ordinal Scale ● Interval Scale ● Ratio Scale **2. Non comparative Scales– Meaning and types** 1. Continuous Rating Scale 2. Itemized Rating Scale ● Likert Scale ● Semantic Differential Scale ● Staple Scale	20

UNIT III	**Data Collection and Preparation** 1. **Data Collection – Tools – Primary Data** 1.Interviews -structured and unstructured 2. Case studies 3. Questionnaire 4. Surveys – Pilot & KAP 5. LaboratoryExperiments **2. Secondary Data** 1. Published Sources 2. Unpublished Sources 3. Reliability and Validity of Tools– Meaning 4. Data Preparation Process – ● Editing ● Coding ● Classification ● Tabulation	**15**
UNIT IV	**Statistical Methods** **1. Parametric and Non-Parametric Tests –** Difference and Applications **2. Data Analysis Process -** **1. Descriptive Analysis-** ● Graphical and Diagrammatic Presentations ● Central Tendency – Mean, Median & Mode ● Dispersion -Standard Deviation **2. Statistical Inference – Tests of Hypothesis** ● t – test ● ANOVA – One Way & Two Way ● Chi- square test – Goodness of Fit & Test of Independence	**25**
UNIT V	**Reporting the Findings and Computer Applications** **1. Report Writing –** ● Importance ● Types ● Mechanics ● Guidelines and Precautions End Notes – ● Bibliography, Appendices, Footnotes and Glossary of terms **2. Computer applications in nutrition research -importance and uses** **3. Applicable Statistical Analysis Software-** ● Literature Searching - PubMed ● Data Analysis- Micro Soft Excel, SPSS, Minitab ● Plagiarism Checker – Turnitin, Scriber	**15**
	TOTAL	**90**

TEXTBOOKS

1. Kothari C R (2004). **Research Methodology – Methods and Methodology.** Delhi, New Age International Pvt. Ltd. 2nd Ed.
2. Chawla, Deepak and Neena Sondhi (2018). **Research Methodology - Concepts and Cases.** Noida, Vikas Publishing House Pvt. Ltd. 2nd Ed.
3. Gupta S.P. (2019). **Statistical Methods.** New Delhi. S Chand & Sons. 45th Ed.

4. Copper, H.M. (2002). **Intergrating Research : A Guide for Literature Reviews.** California: Sage, 2nd Edition.

5. Kerlinger, Foundation of Educational Research Ingle P.O. **Scientific Report Writing.** Nagpur, Sarla P. Ingle.

REFERENCES

- Ranjit Kumar (2011). **Research Methodology : A step-by-step Guide for Beginners,** SAGE Publications. 3rd edition.
- Anderson, David R. and et al. (2013). **Statistics for Business and Economics.** Delhi, Cengage Learning India Pvt Ltd. 11th Ed.
- Bandarkar, P.L. and Wilkinson T.S. (2000). **Methodology and Techniques of Social Research.** Himalaya Publishing House, Mumbai.
- Bell, Judith (2005). **Doing your Research Project – A Guide for First Time Researchers in Education, Health and Social Science.** England, Open University Press. 4th Ed.
- Danial, Wayne W. and Chad L. Cross (2017). **Biostatistics – Basic Concepts and Methodology for the Health Sciences – International Student Version.** New Delhi, ArEmm Internatonal, 10th Ed.

COURSE OUTCOME:

On successful completion of the course the student will be able to

CO No.	CO STATEMENT
CO 1	Demonstrate knowledge of the scientific method, purpose and approaches to research and Become a qualified researcher.
CO 2	Identify and selection of the research sampling and scales of measurement
CO 3	Understand the types of tools applicable to research problem and develop skills of preparing out line of research work and construct common data collection tools
CO 4	Assess the numerical data for providing statistical evidences to support the research results and interpretation of data with the use of tables and pictorial representations
CO 5	Present research data in a scientific manner and Understand the key elements of a research report and various applications of computer in Nutrition research

Mapping: (CO/PSO)

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO6
CO1	1	3	2	2	3	2
CO2	1	1	1	0	2	1
CO3	3	3	3	3	3	2
CO4	1	3	3	0	3	1
CO5	3	2	3	0	0	1
Average	**1.8**	**2.4**	**2.4**	**1**	**2.2**	**1.4**

PEDAGOGY

Lecture, Power Point Presentation, Demonstration, Group Discussion, Assignment, Seminars and Oral & Written Revision.

II YEAR – III SEMESTER

COURSE CODE 23MHF3C2	Core-VIII	T/P	C	H/W
	TRENDS AND ISSUES IN HUMAN DEVELOPMENT	T	5	6

COURSE OBJECTIVES

1. To develop understanding of all round development of the individual from infancy to adulthood.
2. To develop skills in achieving positive human relationships.

UNIT NO.	CONTENT	HOURS
UNIT I	How life begins: Conception-Prenatal Development, Pregnancy: Signs and symptoms of Pregnancy, ante-natal care, prenatal influences, Process of birth and types of birth, Post natal care.	15
UNIT II	Growth and Development: Meaning and Principles of growth and Development. Developmental tasks. Basic concepts of development - maturation and learning, sensitive periods, individual differences, nature-nurture issue. Physical and motor development, emotional, Social and intellectual development of infancy, babyhood, Care during babyhood-feeding, weaning, clothing, immunization	20
UNIT III	Physical and motor development, emotional, Social and intellectual development, developmental task of early childhood Play behavior in Children, early childhood education, early socialization, parenting and cultural process, Childhood illness – communicable diseases, deficiencies diseases – other illnesses.	20
UNIT IV	Physical and motor development, emotional, social and intellectual development of late childhood needs of children - common behavior problems, habits and habit formation. Social relationships-peers, siblings and parents. The experience of schooling-academic achievement.	20
UNIT V	Preschool education; meaning, importance and types. Preschool setup; equipment, characters of preschool teacher, importance of audio visual aids for preschool children. children with special needs definition, classification - physically handicapped, hearing impaired, visually impaired, speech impaired, mentally handicapped, gifted, emotionally and socially adjusted.	15
	TOTAL	**90**

BOOKS FOR REFERENCE:

1. Hurlock, E.B. (2001), **Child Development**, MC Graw Hill, New York
2. Devadas, R.P. and Jaya, N. **Textbook on Child Development,** Macmillan and co.,
3. Neil J. Salkind (2002). **An Introduction,** Kavitha Publications. Macmillan Reference USA.
4. Kal S.V. (2015), **Child Psychology and Child Guidance,** Himalaya Publishing house, Bombay.
5. Sushma Gupta, (2003), **Textbook of Nutrition, Child Care and Psychology**, Kalyani Publisher, New Delhi.

COURSE OUTCOME:

On successful completion of the course the student will be able to

CO No.	CO STATEMENT
CO 1	Knowledge on How life begins: Conception - Prenatal Development, Process of birth and types of birth,
CO 2	Understand the concept of Growth and Development, all round development of Infancy and Babyhood, care during babyhood
CO 3	Understand the Physical and motor development, emotional, Social and intellectual development, Play behavior in Children and early childhood education
CO 4	Assess the Physical and motor development, emotional, social and intellectual development of late childhood needs of children - common behavior problems, habits and habit formation.
CO 5	Identify the Preschool education; meaning, importance and types. children with special needs definition, classification.

Mapping: (CO/PSO)

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO6
CO1	3	3	2	3	1	2
CO2	2	3	3	3	1	2
CO3	3	3	3	3	1	3
CO4	2	3	3	3	1	2
CO5	3	3	3	3	1	3
Average	2.6	3	2.8	3	1	2.4

PEDAGOGY :

Lecture, Power Point Presentation, Demonstration, Group Discussion, Assignment, Seminars and Oral & Written Revision.

II YEAR – III SEMESTER

COURSE CODE 23MHF3C3	Core-IX	T/P	C	H/W
	HOME SCIENCE EXTENSION EDUCATION AND COMMUNICATION	**T**	**5**	**6**

COURSE OBJECTIVES

1. To obtain necessary skills in extension teaching and field work
2. To study the existing oraganizations at village and block levels.
3. To understand the concept of development communication and its relevance to fostering development
4. To know the role of extension workers in planning programmes for the community.

UNIT NO.	CONTENT	HOURS
UNIT I	Extension Education — Concept, aim, Philosophy and Principles of Extension education. Extension Education and its relationship with other Social Sciences. Home science extension - Meaning, Objectives and role of Home Science Extension in national development.	**15**
UNIT II	Administrative setup for rural development - Central, State, District, Block and village level. Extension personnel working at block level, role and functions of women extension workers, qualities of an extension worker, training women extension workers.	**20**
UNIT III	Programme Planning, Meaning, and principles, developing a plan of work - Definition, analysis of the concept, Importance and scope of Extension. Steps in Programming evaluation- Criteria for judging the plan of the work.	**20**
UNIT IV	Communication and Extension - Approaches for development. Advantages - Individual, Group and mass approaches, Motivation, Methods of extension teaching, Teaching tools, Difference in methods of extension and formal education, Direct contact, demonstration method. Audio visual aids - visual aids, audio aids and other teaching Aids. Communication through written words and satellite.	**20**
UNIT V	Community Development Programme - meaning, objectives, types and Principles of community development — Programme in India - Socio-Economic programmes — IRDP, TRYSEM , DWACRA, ICDS, Social forestry. Community Organization - meaning, scope, role and characteristics of Community Organisation - Women's Club, Youth Club. Extension Training Institution — Meaning, Need and importance, principles of training institutions KVIC , RETC, NYK.	**15**
	TOTAL	**90**

Related Experience / Practical :

1. Visit to Block to understand its set up and importance in Rural Development
2. Visit to DRBA and discussion with officials on the current programme.
3. Visit to K.V.K / RETC.
4. Visit to a Mahila Mandal.
5. Planning and Implementing a programme for Women and Children

6. Familiarizing with audio visual aids
7. Studying the functions of ICDS.

Books for Reference:

1. Serene Shekhar, (Gote) and Santhosh Ahlawat, (2013). **Text Book of Home Science Extension Education,** New Delhi : Daya Publishing House.
2. Pankajam, G. (2000). **Extension – Third Dimension of Education,** New Delhi : Gyan Publishing House.
3. Adivi Reddy A. (1999). **Extension Education,** Bapatla: Sree Lakshmi Press.
4. Supe, S.V. (1983). **An Introduction to Extension Education**, New Delhi : Oxford AD. IBH Publishing company.
5. Dahama, O.P. and Bhatnagar, O.P. (1985). **Education and communication for development,** New Delhi: Oxford IBH publishing company.

CO No.	CO STATEMENT
CO 1	Knowledge on Concept, aim, Philosophy, Principles of Extension education and role of Home Science Extension in national development
CO 2	Understand the concept of Administrative setup for rural development, role and functions of women extension workers.
CO 3	Understand the Programme Planning, Meaning, and principles, Importance and scope of Extension. Steps in Programme planning
CO 4	Assess the Communication and Extension - Approaches for development. Methods of extension teaching, Audio-Visual aids.
CO 5	Identify Community Development Programme - meaning, objectives, types and Principles of community development Programme in India

Mapping of Co with PSO:

CO/PSO	PSO 1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	3	1	2
CO2	2	3	3	3	1	2
CO3	3	3	3	3	1	3
CO4	2	3	3	3	1	2
CO5	3	3	3	3	1	3
Average	2.6	3	2.8	3	1	2.4

PEDAGOGY

Lecture, journal reviewing, Assignments, Power point presentations, video presentations.

II YEAR – III SEMESTER

COURSE CODE 23MHF3C4	Core-X	T/P	C	H/W
	INSTITUTIONAL FOOD SERVICE MANAGEMENT	T	4	6

COURSE OBJECTIVES

The course aims to

- Provide a comprehensive understanding of the basic principles of management in food service units.
- Helps to accept responsibilities in catering establishment and hospitals
- Paves away for becoming a conscientious caterer and food service administrator

UNIT NO.	CONTENT	HOURS
UNIT I	**Food Service Establishment** (b) History and development b) Definition and importance c) Factors affecting development of Food Service institutions d) Principles, tools and functions of organizations e) Recent trends in food service institutions. **Various Types of Food Service Institutions** a) Commercial and Non-commercial b) Various institutions catering needs to different types of handicapped personnel c) Various approaches in the management of Food Service Institutions - traditional – systems approach - MBO and TQM.	15
UNIT II	**Personnel Management** a) Definition, development and policies b) Sources of recruitment, Selection, Induction, training, development, promotion, motivation and leadership c) Wages and other welfare benefits for personnel d) Labor laws and other legal aspects. Recruitment, Selection, Induction, Training and Supervision of Personnel, Labour Policies and Legislation.	20
UNIT III	**Food Service Unit Layout and Equipment** Food Service Unit Layout and Design a) Steps and different types of Planning, b) Various Phases of layout and Various factors influencing layout design c) Pointing work centers d) Work pattern. **Equipments** a) Classification, Selection and Design b) Factors influencing selection of various equipments c) Base materials and finishes in food industries d) Installation and operation e) Care and maintenance of equipments. Types of Food Service, Styles of Service, Formal and Informal. Equipments, Classification, Selection, Maintenance and Care of equipment.	20
UNIT IV	**Financial Management** a) Types of budget, Records for purchase, Receiving, Storage and Production b) Service and income and expenditure record c) Costing and cost control - Factors affecting cost control – Importance and Components of Costing – Breakeven Analysis - Determining Selling Price of Food – Check list for Cost Control.	20

UNIT V	**Institutional kitchen and Sanitation** Types of kitchen, layout of kitchen, kitchen design plan and work simplification. Hygiene and sanitation in preparation and serving area a) Personal hygiene b) Types and sources of contamination c) Prevention and safety measures d) Methods of controlling infestation e) Methods of dishwashing	**15**
	TOTAL	**90**

References:

1. Payne-Palacio and Monica (2015). **Food Service Management.** Pearson Education UK,.
2. Sethi, Mohini (2008).. **Institutional Food Management. New Delhi:** New Age International.
3. Cousins, John, Dennis Lilli crap, and Suzanne Weekes (2014). **Food and Beverage Service** Hachette UK.
4. Vijay Dhawan (2000). **Food and Beverage Service.** 1st Edition, Frank Bros & Co., Braun.
5. Aggarwal D.K. (2006). **House Keeping Management**. AMAN Publications, New Delhi.
6. Singh R.K. (2006). **Modern Trends in Hospitality Industry.** AMAN Publications, NewDelhi.

Reference Books

1. Fospett Dand Paskins P.(2011). The theory of Hospitality and Catering, Hodder Education,UK.
2. Jaiswal P. (2011). Food Quality and safety, CBS Publishers and Distributers Pvt Ltd, New Delhi.
3. Bali P.S. (2011), Quantity food Production operations & Indian Cuisine, Oxford University Press New Delhi,
4. George B. and Chatterjee S. (2010). Food and Beverage Service and Management, JAICO.

Course outcomes

On successful completion of the course

CO No.	CO STATEMENT
CO1	Discuss about the scope of food service management principles and functions.
CO2	Explain the functions of personnel management organization
CO3	Compare the electrical and non-electrical equipment's in food service establishment.
CO4	Analyze the cost account methods and its importance.
CO5	Evaluate the kind of kitchen layout.

Mapping of Cos with POS & PSOs:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	3	1	2
CO2	2	3	3	3	1	2
CO3	3	3	3	3	1	3
CO4	2	3	3	3	1	2
CO5	3	3	3	3	1	3
Average	2.6	3	2.8	3	1	2.4

PEDAGOGY

Lecture, journal reviewing, Assignments, Power point presentations, video presentations.

II YEAR – III SEMESTER

COURSE CODE 23MHF3E1	DSE-V A	T/P	C	H/W
	FOOD PROCESSING AND TECHNOLOGY	**T**	**3**	**3**

COURSE OBJECTIVES:

To enable the students:

1. Understand the science behind processing of foods and its impact on nutritive value of food stuffs.
2. Acquire in-depth knowledge on production of processed food products and the waste utilization techniques.
3. Understand the changes in physicochemical properties of foods due to processing condition.
4. Understand the various parameters related to post-harvest technology.

UNIT NO.	CONTENT	HOURS
UNIT I	**Processing of Foods:** Primary, secondary and tertiary processing, historical perspective, traditional technologies used in food processing. Effects of processing on components, properties and nutritional value of foods. **Enzymes in Food Processing:** Enzyme- Review of classification, enzyme inhibitors, enzymatic browning.	**15**
UNIT II	**Cereal Processing and Technology:** **Rice:** parboiling, milling and pearling; Processing and milling of wheat, maize, barley, oats and rye. **Millets:** processing of millets; **Cereal Products:** Flours and its quality; Processed products of rice, wheat and maize; By products utilization; breakfast cereals and extrusion; Effect of processing on nutritive value of cereals; changes in physiochemical properties of cereal starch and protein due to processing. **Milling process:** Complete milling process, break rolls, reduction rolls, milled products and their nutritive value and applications. **Pulse Processing and Technology:** Dals, flours, protein concentrates, isolates and hydrolysates; Byproducts utilization; Effect of processing on nutritive value and physiochemical properties of pulses. **Nuts and Oil Seeds Processing and Technology:** Nuts Processing methods, Oil seeds processing: Oil extraction methods and refining process; byproducts utilization; Effect of processing on nutritive value and physiochemical properties of vegetable oils.	**20**
UNIT III	**Vegetables Processing and Technology:** **Pigments:** Classification, effects on processing of vegetables; Preliminary processing of vegetables; **Vegetable products:** Fermented and non fermented and its shelf life; Vegetable waste utilization; Effect of processing on nutritive value and physiochemical properties of vegetable	**20**

	Fruits Processing and Technology: Concept of maturity, ripening and senescence; Methods of fruit processing technologies: traditional and new methods. **Fruit products:** Fermented and nonfermented; Effect of processing on nutritive value and physiochemical properties of fruits; **Browning reactions:** types and mechanism; prevention methods; Fruit waste utilization. **Milk Processing and Technology:** Milk types, composition, physiochemical properties; Milk processing-Separation, centrifugal process, natural creaming, pasteurization, sterilization, homogenization. Milk storage; Effects of processing on nutritive value and physicochemical properties of milk	
UNIT IV	**Egg Processing and Technology:** Egg processing and storage; Effect of processing on nutritive value and physiochemical properties of eggs; changes in egg quality during storage and preservation methods. **Meat Processing and Technology:** Meat processing and storage; Factors influencing meat quality; Ageing and tenderization of meat. **Poultry:** Processing and storage of poultry meat; Preservation methods for poultry. **Fish:** Processing and storage; Preservation methods for fish. Effect of processing on nutritive value and physiochemical properties of meat, poultry and fish.	**20**
UNIT V	**Introduction of post-harvest technology** Introduction to post - harvest technology of agricultural produce; Status of Production, Losses, Need, Scope and Importance. Post-Harvest Loss - Definition, Factors contributing to Post-harvest Loss; and Technologies and Practices to reduce Post-harvest Losses.	**15**
	TOTAL	**90**

TEXTBOOKS

1. Shakuntala Manay N. Shadak Cheraswamy M . (2004). **Food Facts and Principles.** New age Publisher. 2nd edition.
2. Roday S. (2011). **Food Science.** Oxford Publication . 1st edition.
3. B Srilakshmi (2015). **Food Science.** New Age Publishers. 6th edition.
4. Fellows P.(2000). **Food Processing Technology**, 2nd Edition.
5. Wood Head Publishing Limited and CRC Press LLC. 1st edition.
6. Avantina Sharma. (2017). **Text Book of Food Science and Technology.** CBS Publisheres and distributes Ltd. 3rd edition.

REFERENCES

1. Raocg. (2006). **Essentials of Food Process Engineering**. PHI learning private ltd.
2. Janet D. Ward and Larry Ward. (2006). **Principles of Food Science**. Stem Publishers. 4th edition.
3. Srivastava R.P. and Kumar S. (2006). **Fruits and Vegetables Preservation - Principles and Practices.** International Book Distributing Co. 3rd edition.

4. W.B. Crusess (2004). **Commercial Unit and Vegetable Products.** W.V. Special Indian Edition, Pub Agrobios India. 2nd edition.
5. Forsythe S.J. and Hayes P.R. (1998). **Food Hygiene, Microbiology and HACCP.** Gaitersburg Maryland Aspen.
6. Eskein. (2012). **Biochemistry of Food.** Elsievier Publications. 1st edition.

E-LEARNING RESOURCES:

1. http://www.fao.org/3/V5030E/V5030E00.htm
2. https://fmtmagazine.in/fruits-vegetables-processing-technologies/
3. https://www.actioncontrelafaim.org/wp-content/uploads/2018/01/technicalpaper_phl.pdf
4. https://www.nutsforlife.com.au/resource/nuts-and-processing/ https://www.fssai.gov.in/

COURSE OUTCOME:

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

CO No.	CO Statement
CO1	The concepts and principles of food processing.
CO2	The various processed food products from plant and animal sources.
CO3	The by-products utilization from food processing.
CO4	The systematic knowledge of basic and applied aspects in food processing and technology
CO5	The various post-harvest technologies for different food products

MAPPING (CO/PSO):

CO/PO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	2	2	2
CO2	3	3	2	2	3	2
CO3	2	3	2	1	2	2
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3
Average	2.8	3	2.6	2.2	2.6	2.4

PEDAGOGY:

Lecture, Journal Reviewing, Power point presentations, Assignments and Discussions

II YEAR – III SEMESTER

COURSE CODE	DSE-V B	T/P	C	H/W
23MHF3E2	SURFACE EMBELLISHMENTS	T	3	3

COURSE OBJECTIVES:

1. To enable the trainees to learn basics in embroidery.
2. To design and develop wedding / party wears and garments.
3. To get well trained in Aari Embroidery
4. To develop wall hangings, bags and other products using Aari embroidery stitches.
5. To enhance their employability skills

UNIT NO.	CONTENT	HOURS
UNIT I	**Introduction to Surface Ornamentation**- and Embroidery – General rules for Hand and Machine Embroidery – Special Attachments to Sewing Machines for Embroidery – Tools and Equipment's – Needles – Threads Punching, Design Transforming and Tracing methods.	15
UNIT II	**Hand Embroidery stitches** - Running Stitch – Laced Running Stitch - Back stitch – Stem Stitch – Satin stitch – French Knot - Bullion Knot – Cross Stitch - Blanket Stitch – Button Hole Stitch – Corel Stitch – Spider Web Stitch – Fly Stitch – Feather stitch - Chain Stitch – Lazy Daisy Stitch – Roumanian Stitch – Chevron Stitch – Cretan Stitch – Faggoting Stitch – Fern Stitch – Fish Bone Stitch – Herringbone Stitch – Couching. Techniques of Crocheting, Tatting and hand knitting to produce different designs.	20
UNIT III	**Special stitches** - Counted thread work on canvas material – Drawn Thread Work – Cut Work – Bead Work – Mirror Work – Sequins Work. Designing and producing fabric appliqués and placing it on children and women's apparel.	20
UNIT IV	**Machine embroidery stitches** using SNLS machines – running stitch, long and short stitch, cut work. A detailed study on computerized embroidery machines – Concept of designing using software – Method of punching designs – Special attachments for sequins – Cording – Boring – Chenille works.	20
UNIT V	**Introduction to print designs** - Tie and dye techniques – Spotting, Marble effect, Chevron effect using stitches and different types of folding to create new designs. Techniques of Batik – Free hand drawing, Stitches over a design, Marble effect, splashing of wax on fabric before dyeing and other creative ideas. **Fabric Painting** – Outline drawing, Shading with dry and wet strokes. Stencil preparation and use of stencils to produce designs - tooth brush spraying and other creative techniques.	15
	TOTAL	90

Text books

1. Navneet Kaur, Comdex Fashion Design: Fashion Concepts, Dream Tech Press, New Delhi,Vol-I (2010).
2. Manmeet Sodhia., Dress Designing. Kalyani Publishers; New Delhi (2001).
3. Shailaja, Surface Designing for Textile Fabrics, D. Naik Jacquie A.Wilion Publisher (2006).

Reference book

1. Premlathe Mullick., Text Book of Home Science, Kalyani Publishers. New Delhi (2007).
2. Reader's Digest, Sewing Guide, Complete Guide for Sewing, The Reader's Digest Association Inc.,13th Edition (2004).

3. Dr. Paul., Traditional Indian and Textiles. Abhishek Publications, Chandigarh. (2004).
4. Jean Ray Laury, Applique Stitchery, Reinhold Pub.co, New York (2000).
5. Cookie Lyday Sterling, Delightful projects using Easy Techniques, Country Ribbon crafts

COURSE OUTCOME:

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

CO No.	CO Statement
CO1	Know the Surface Ornamentation and Embroidery, General rules for Hand and Machine Embroidery
CO2	The various Hand Embroidery stitches and techniques of Crocheting, Tatting and hand knitting to produce different designs
CO3	Apply Special stitches and designing and producing fabric appliqués and placing it on children and women's apparel
CO4	Know the concept of Machine embroidery stitches and computerized embroidery machines
CO5	Assess the print designs - Tie and dye techniques, techniques of Batik, free hand drawing ANDFabric Painting

Mapping of Co with PSO:

CO/PSO	PSO 1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	3	1	2
CO2	2	3	3	3	1	2
CO3	3	3	3	3	1	3
CO4	2	3	3	3	1	2
CO5	3	3	3	3	1	3
Average	2.6	3	2.8	3	1	2.4

PEDAGOGY

Lecture, journal reviewing, Assignments, Power point presentations, video presentations.

II YEAR – III SEMESTER

COURSE CODE 23MHF3S1	SEC-II A	T/P	C	H/W
	SPORTS NUTRITION	**T**	**2**	**3**

COURSE OBJECTIVES :

To enable the students to

1. Learn the effects of exercise on the physiological and energy systems of the body
2. Understand the link between exercise and the demand it places on the nutrients in the body
3. Translate nutrient goals of an athlete into appropriate diet plans that can enhance Performance

UNIT NO.	CONTENT	HOURS
UNIT I	**Exercise - Principles, Assessment and Weight Management** a. Definition of Exercise, Types of exercise, Principles of exercise training. Type of Athlete - Resistance, Endurance and Power athlete b. Assessment- Methods of assessment of Body Composition relationship between body composition and performance c. Weight Management –Weight loss and weight gain as preparation for competition	**15**
UNIT II	**Exercise Physiology and Energy Systems** a. Muscle Physiology - Structure of skeletal muscle, muscle fiber types, muscular contraction, muscular adaptation to exercise; Cardio pulmonary response and adaptation to exercise; Exercise training and endocrine system b. Energy system for exercise – Creatinine Phosphate energy system, Anerobic glycolytic system, aerobic energy system –oxidative phosphorylation	**15**
UNIT III	**Fuelling for Exercise** a. Carbohydrate – utilization of carbohydrate during exercise, carbohydrate recommendations for athlete, guidelines for intake before, during and after exercise; carbohydrate loading b. Protein - protein recommendation for athletes, timing of protein intake, effects of inadequate and excessive protein intake on performance and health, use of protein and amino acid supplements, consideration of protein intake for vegetarian athletes. c. Fat- Fat as a source of energy for exercise, fat loading, fat recommendation for athlete, effect of inadequate intake of fat on performance and health	**15**
UNIT IV	**Role of Vitamins and Minerals** a. Vitamins – recommended intake of vitamins for athletes, Influence of exercise on vitamin requirements, antioxidant function b. Minerals – recommended intake of minerals for athlete; importance of Ca. Fe, Zinc and Mg in an athlete's diet; female athletic triad	**15**

UNIT V	**Role of Fluid, Electrolytes and Nutritional Supplements** a. Effect of exercise on fluid and electrolyte balance; hypohydration, hyperhydration, hyponatremia, maintenance of hydration before, during and after exercise. Use of sports drinks b. Definition of nutritional ergogenicaids and dietary supplements. Types of dietary supplements most frequently used by athletes, benefits and / or risks in the use of supplements, mechanism of action and supplement protocol.	**15**
		75

REFERENCES BOOKS

1. Bean A. (2000). **The Complex Guide to Sports Nutrition**. A&C Black Publishers, London.
2. Clark N. (2003). **Sports Nutrition Guide Book**. Human Kinetics, U.S.A.
3. Dunford M. and Doyle A.J. **Nutrition for Sport and Exercise.** Thomson Wadsworth, Australia.
4. Fink H.H., Mikesky A.E., Burgoon L.A. (2012). **Practical Applications in Sports Nutrition.** Jones and BarlettLearning, U.S.A.
5. Bagchi D., Nair S., Sen C.K.,Ed., (2013). **Nutrition and Enhanced Sports Performance – Muslce Building, Endurance and Strength.** Elseveir, Academic Press, UK, USA.
6. Srilakshmi B., Suganthi., Ashok C.K., (2016). **Exercise Physiology, Fitness and Sports Nutrition.** New Age International Private Limited.

E-LEARNING RESOURCES

1. http://www.aco.org.nz/pdf/nutrition-for-sports
2. https://www.researchgate.net/publication/258630492_Sports_Nutriti_Book_2013http://themedicalbiochemistrypage.org.

COURSE OUTCOME

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

CO No.	CO STATEMENT
CO1	Recall the principles of exercise training, distinguish between various types of athletes and methods of body assessment, relate body composition to performance and identify suitable training and eating plans for weight management
CO2	Explain the structure of muscle fiber, process of skeletal muscle contraction. Discuss muscular plasticity, cardio pulmonary adaptation and endocrinal response to exercise
CO3	Demonstrate the skill to choose foods and create meal plans before, during and after exercise or competition which enhance performance
CO4	Identify and include foods in daily eating plans that meet the enhanced micronutrient requirements of an athlete
CO5	Analyse hydration and electrolyte requirements of an athlete and evaluate dietary supplements for recommendation to athletes

MAPPING OF CO WITH PSO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3
Average	3	3	3	3	3	3

PEDAGOGY:

Lecture, journal reviewing, Assignments, Power point presentations, video presentations.

II YEAR – III SEMESTER

COURSE CODE 23MHF3S2	SEC-II B	T/P	C	H/W
	SCIENTIFIC WRITING	T	2	3

COURSE OBJECTIVES :

1. to be able to appreciate and understand importance of writing scientifically
2. to develop competence in writing and abstracting skills and
3. to write either a draft research proposal or a chapter of dissertation.

Specific Objectives of Learning

1. To differentiate the different means of communication of research
2. To construct different types of tables for data presentation
3. To discuss the steps in research writing
4. To develop skills in preparing research proposal for funding.

UNIT NO.	CONTENT	HOURS
UNIT I	**Scientific writing as a means of communication** Different forms of scientific writing Articles in Journals, Research notes and reports, review articles, Monographs, Dissertations, Bibliographies.	15
UNIT II	**How to formulate outlines** The reasons for preparing outlines a. as a guide for plan of writing b. as skeleton for the manuscript Kinds of outline a. topic outlines b. conceptual outline c. sentence outlines d. combination of topic and sentence outlines	15
UNIT III	**Drafting Titles, Sub Titles, Tables, Illustrations** • Tables as systematic means of presenting data in rows and columns and lucid way of indicating relationships and results. • Formation Tables : Title, Body stab, Stab Column, Column Head, Spanner Head, Box Head • Appendices : Use and guidelines	15
UNIT IV	**The writing process** • Getting started • Use outline as a starting device • Drafting • Reflecting, Re-reading a. Checking organization b. Checking headings c. Checking content d. Checking clarity e. Checking grammar • Brevity and precision in writing • Drafting and Re-drafting based on critical evaluation • Writing Bibliography as per APA style	15

UNIT V	**Writing for Grants** • Clearly state the question to be addressed • Rationale and importance of the question being address • Empirical and theoretical conceptualization • Presenting pilot study/data • Research proposal and time frame • Clarity, specificity of method • Clear organization • Outcome of study and its implications • Budgeting • Available infra-structure and resources • Executive summary	**15**
	TOTAL	**90**

REFERENCES :

1. APA (1984). **Publication Manual of American Psychological Association** (3rd edition). Washington: APA
2. Cooper, H.M. (1990). **Integrating Research: A Guide for Literature Reviews** (2nd edition). California: Sage Publications.
3. Dunn, F.V. & Others. (Ed.) (1994). **Disseminating Research: Changing Practice.** California: Sage Publications.
4. Harman, E & Montagnes, I. (Eds.). (1997). **The Thesis and the Book.** New Delhi: Vistaar.
5. Locke, L.F. and Others (1987). **Proposals that work: A guide for Planning Dissertations & Grant Proposals.** (2nd Ed.) Beverly Hills: Sage Publications.
6. Richardson, L. (1990). **Writing Strategies. Reaching Diverse Audience.** Califormia: Sage Publications.
7. Thyer, B.A. (1994). **Successful Publishing in Scholarly Journals.** California: Sage.
8. Seyler, U. Dorothy (1999). **Doing Research :The Complete Research Paper Guide.** Boston: McGraw-Hill College.

COURSE OUTCOME

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

CO No.	CO STATEMENT
CO1	Gain Knowledge on Different forms of scientific writing - Articles in Journals, Research notes and reports, review articles, Monographs, Dissertations, Bibliographies
CO2	Identify How to formulate outlines, Kinds of outline
CO3	Discuss the Drafting Titles, Sub Titles, Tables, Illustrations
CO4	Identify and include **The writing process -** Getting started, Use outline as a starting device, Drafting and Reflecting, Re-reading, Brevity and precision in writing
CO5	Discuss **Writing for Grants -** Presenting pilot study, Research proposal and time frame, Clarity, specificity of method, Clear organization, Budgeting and Available infra-structure and resources

MAPPING OF CO WITH PSO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	2	3	3	3	3	3
CO3	3	3	2	3	3	3
CO4	3	3	3	3	3	2
CO5	3	3	3	2	3	3
Average	2.8	3	2.8	2.8	3	2.8

PEDAGOGY:

Lecture, journal reviewing, Assignments, Power point presentations, video presentations.

II YEAR – III SEMESTER

COURSE CODE 23MHF3I	SEC-II B	T/P	C	H/W
	INTERNSHIP ACTIVITY IN HOSPITALS		**2**	

The students are expected to undergo a dietetic internship for a minimum of 15 days at any reputed hospital that has a Dietary Department operated by Registered Dietitians.

OBJECTIVE: The Internship is committed to preparing graduates in the M.Sc. Home Science Degree to join as entry level dietitians with a strong foundation in the theory and application of medical nutrition therapy.

EXPECTED OUTCOME OF THE INTERNSHIP :

On successful completion of the internship, the student :

1. Learns how a dietary department functions and the specific roles and responsibilities of a dietitian.
2. Develops skills in nutrition screening and assessment.
3. Acquires training in nutrition diagnoses of each patient assessed.
4. Acquires training in preparation of enteral formula feeds.
5. Demonstrates the ability to implement nutrition care plans; document nutrition care provided maintain internship logbook and monitor outcomes of the nutrition plan.
6. Displays familiarity with the use of standardized terminology in documentation.
7. Demonstrates competency in professional presentation, communication and writing skills.
8. Acquires training in diet counselling, online counseling and group counseling.
9. Is trained in the preparation and presentation of case studies/short communications for publication.

EVALUATION

Internship will be carried out during the summer vacation after the second semester and the intern will be evaluated at the hospital on a continuous assessment basis, while the report submitted by the student will be evaluated by two examiners: one from with in the hospital and one from the college or institution to which the student belongs.

II YEAR – IV SEMESTER

COURSE CODE 23MHF4C1	Core-XI	T/P	C	H/W
	PUBLIC HEALTH NUTRITION	T	5	6

COURSE OBJECTIVES

- To understand the concept of Public Nutrition.
- To enable students to develop a holistic knowledge base on the importance of understanding the nutrition problems and their prevention.
- To understand the nutritional problems during emergencies / disasters as well as the strategies to tackle them.
- To develop skills in preparation of communication aids and planning nutrition education programme for the community

UNIT NO.	CONTENT	HOURS
UNIT I	**CONCEPT OF PUBLIC NUTRITION** ● Nutrition and Health in National Development ● Relationship between health and nutrition, National Health Care Delivery System, Determinants of Health Status, Indicators of Health. ● Nutritional deficiency disorders in India -Prevalence, Etiology, Symptoms, Current status and Recent updates- PEM, VADD, IDD, Anemia. ● Nutrition and infection ● Role of public nutritionists in the health care delivery system.	15
UNIT II	**ASSESSMENT OF NUTRITIONAL STATUS** ● **Direct methods: Direct** methods of Nutritional assessment, Nutritional anthropometry, biochemical, clinical and dietary assessment and Growth charts - plotting of growth charts, growth monitoring and promotion (GMP). ● **Indirect methods:** Demography, population dynamics and vital health statistics and their health implications. Food balance sheets, recent nutritional assessment methods- MUST, SGA, SOAP. Indicators ofhealth and nutrition. Causes of Malnutrition- Vicious cycle of malnutrition ● Basic concepts of Nutritional Surveillance- Millennium Development Goals (MDG)	15
UNIT III	**STRATEGIES FOR IMPROVING NUTRITION STATUS AND HEALTH STATUS OF THE COMMUNITY** • **Immunization**: Awareness, types of vaccines, Importance and schedule of Immunization. • **Measures to overcome malnutrition in India** • **Food Security** -Concepts, Meaning and significance, Food security act. Food fortification and Food enrichment, Genetic improvement of foods, National nutrition policy and action plan • **Nutrition intervention programmes** - Mid day Meal Programme, Balwadi Feeding Programme. Public Distribution System (PDS), Antyodaya Anna Yojana (AAY), Annapurna Scheme, Food for Work Programme, Special Nutrition Programme, • **Nutrition Intervention Schemes and programmes operating in India-** Control programmes - Vitamin A, Anemia, Goiter, Malnutrition. Environmental sanitation and health.	15

UNIT IV	**ORGANIZATIONS TO COMBAT MALNUTRITION AND NUTRITION DURING EMERGENCIES AND SPECIAL CONDITIONS** ● **International organizations** concerned with food and nutrition FAO, WHO, UNICEF, CARE, AFPRO, CWS, CRS, World Bank. ● **National organization** – NIN, CFTRI, ICMR, ICAR, CFTRI, CHEB, NIPCCD, DFRL, NGOs. ● **Nutritional deficiency diseases in emergencies**- Major and micro nutrient. Control of communicable diseases in emergencies- Factors responsible for spread of communicable disease, mode of transmission and prevention of chicken pox, malaria, swine flu, tuberculosis, COVID-19 and AIDS. ● Nutritional requirement for space mission, sea voyage and army.	**15**
UNIT V	**NUTRITION EDUCATION AND EXTENSION OF BETTER NUTRITION** ● **Nutrition education for the community** –Objectives, Definition and Importance of nutrition education to the community, Principles of planning, executing and evaluating nutrition education programmes. ● **Development and Use of AV aids in Public Nutrition Education**. - Charts, flip chart, posters, flannel board, models, OHP.	**15**
	TOTAL	**90**

ACTIVITY

1. Planning and evaluation of nutrition education programmes in community. Preparation of communication aids for different groups.
2. Development of low-cost recipes for infants, pre-schoolers, elementary school children, adolescents, pregnant and lactating mothers.
3. Field visits to ongoing national nutrition programmes.

TEXT BOOKS

1. Park, K. (2013). **Text Book of Preventive and Social Medicine.** M/s.Banarsi das Bhanot Publishers, Jabalpur. 22nd Edition.
2. Suryatapa Das (2020). **Textbook of Community Nutrition.** Academic Publishers, Kolkata. 4th Edition
3. Srilakshmi, B (2017). **Nutrition Science.** New Age International Publishers. Multi Colour 6th Edition.
4. Connolly, M.A. (2005). **Communicable Disease Control in Emergencies: WHO,** WHO Library Cataloguing-in-Publication Data.
5. WHO (2002). **The Management of Nutrition in Major Emergencies.** Published by AITBS Publishers, New Delhi.

REFERENCES

1. Muthu V.K. (2014). **A Short Book of Public Health,** Jaypee Brothers Medical Publishers. 2nd edition
2. Srridhar Rao B. (2018). **Principles of Community Medicine**, AITBS Publishers India. 6th edition.
3. Scott M. Smith, Sara R. Zwart and Martina Heer (2014). **Human Adaptation to Space Flight: The Role of Nutrition.** NASA Publication.
4. Owen, A.Y. and Frackle, R.T., (2002). Nutrition in the Community. The Art of Delivering Services. Times Mirror/Mosby. 2nd Edition.

5. Carolyn D. Berdanier Johanna T. Dwyer David Heber (2014). **Handbook of Nutrition and Food**, CRC Press, New York. Third Edition.

E - LEARNING RESOURSES:

1. https://apps.who.int/iris
2. http://egyankosh.ac.in/bitstream/123456789/33312/1/Unit-18.pdf
3. https://www.seafarerswelfare.org/assets/documents/ship/SHIP-HealthyFood_A5_20151209_LR.pdf

COURSE OUTCOME:

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

CO No.	CO STATEMENT
CO1	Understand the role of nutrition in national development
CO2	Acquire skill in assessment of nutritional status of community.
CO3	Gain depth knowledge on Strategies for Improving nutrition status and health status of the community.
CO4	Evaluate the role organization in combating malnutrition.
CO5	Understand and apply Nutrition education for the community welfare.

Mapping(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	3	3	3
CO2	3	2	3	3	3	3
CO3	2	3	3	3	3	3
CO4	3	3	3	3	2	3
CO5	3	3	3	3	3	3
Average	**2.8**	**2.8**	**2.8**	**3**	**2.8**	**3**

PEDAGOGY:

Lecture, journal reviewing, Assignments, Power point presentations, video presentations.

II YEAR – IV SEMESTER

COURSE CODE 23MHF4C2	Core-XII	T/P	C	H/W
	NUTRITION THROUGH LIFE CYCLE	T	4	6

COURSE OBJECTIVES

To enable the students to

1. Understand the importance of nutrition through various life stages
2. Determine nutrient needs for all age groups and calculate the basic nutritional requirements
3. Develop a plan of action and implement nutritional care plan for every age group.

UNIT NO.	CONTENT	HOURS
UNIT I	**Prenatal and Infant Nutrition** a. Foetal origins of adult disease, intrauterine growth retardation, low birth weight, cleftpalate, foetal alcohol syndrome–causes and consequences. b. Infancy – current feeding practices and nutritional concerns, guidelines for feeding normal and low birth weight infants. Growth and nutritional assessment – Growth chart, LBW babies – characteristics and nutritional care. c. Nutritional assessment, nutrient needs, lactose intolerance, infant formula–types, complementary foods-liquid, semi-solid and solid food choices, special nutritional concerns in infant feeding. Feeding the premature infant, allergies and infant obesity. Develop low cost supplementary foods.	15
UNIT II	**Nutrition during Childhood** a. Childhood – Growth and development, food and nutrient needs, dietary adequacy. Factors influencing food choices, food acceptance, parental influences. Development of healthy gut micro biome. Aetiology and treatment of PEM, Vitamin A Deficiency, Anaemia. Planning meals for children with Attention-deficit / hyperactivity disorder (ADHD), autism and dyslexia. Immunization schedule for children. b. School age - Growth and development, food and nutrient needs, dietary adequacy. Food choices, meal patterns, prevention of nutrition and health problems. Causes and consequences of stunting, underweight, wasting, overweight, obesity and dental caries. c. Packed lunch – dietary guidelines and nutritional requirements. Planning packed lunch for various income groups.	15
UNIT III	**Nutrition during adolescence** a. Growth and development, food and nutrient requirements b. Food habits, irregular meal pattern, peer pressure, eating disorders. Pros and cons of popular fad diets. Planning balanced diets for adolescents. c. Causes, consequences and treatment of adolescent pregnancy, PCOD, hormonal imbalance, premenstrual syndrome, anaemia, underweight, obesity.	10

UNIT IV	**Nutritionin Pregnancy and Lactation** a. Maternal nutrition –Factors influencing fertility, food and nutrient requirements, Effects of nutritional deficiencies during pregnancy, Physiological changes, weight gain during pregnancy, typical food preferences, PICA b. Effects of smoking, drugs and alcohol on stages of foetal growth and pregnancy outcome. Complications and discomfort during pregnancy - Nausea, vomiting, constipation, heartburn, PIH, eclampsia, pre-eclampsia and gestational diabetes. c. Lactation and breast milk – Physiology of lactation. Nutritive value andcomposition of breast milk - Colostrum. Food and nutrient requirementsfor nursing mother, advantages of breast feeding, importance of breastfeeding over formula feeds. Public health measures for pregnant andlactatingwomen.Complications duringlactation. d. COVID protocols for pregnant and lactating women. Planning balanced diets or pregnant and lactating women.	**20**
UNIT V	**Nutrition in Adulthood and Oldage** a. Food and nutrient requirements during adulthood. Nutritional concerns in adulthood related to nutrient deficiencies. Signs and symptoms of menopause. Effect of occupational hazards, stress related disorders and lifestyle modifications to overcome them. b. Geriatric nutrition - Food and Nutritional requirements - Nutritional care of the elderly. Physiological changes affecting digestion and absorption. Food selection patterns of the elderly. Nutritional problems of oldage. c. Planning balanced diets for adults and elderly based on special needs and requirements.	**15**
	TOTAL	**90**

REFERENCES BOOKS :

1. Nix S. (2016). **Williams' Basic Nutrition and Diet Therapy,** 15th Edition, Elsevier.
2. Simon Langley-Evans, (2015). **Nutrition, Health and Diseas e: A Lifespan Approach**. 2ndEdition, Wiley Blackwell.
3. Jacalyn J. McComb, Reid Norman, et al., (2010). **The Active Female: Health Issues Through out the Life Span**, Human Press.
4. AletaL. Meyer and Thomas P. Gullotta., (2012). **Physical Activity Across the Life Span: Prevention and Treatment for Health and Well-Being** (Issues in Children's and Families' Lives), Springer.
5. Antia, F.P., (1992). **Clinical Dietetics and Nutrition**. Oxford University Press, New Delhi.
6. Corinne, R.H.,(1996). **Normal and Therapeutic Nutrition,** Mcmallian Co., New York.
7. Davidson, S.R. and Passmore J.F., (1989). **Human Nutrition and Dietetics,** ELBS London.
8. Mahan, K. L., and Stump, S. E., (1996). **Krauses Food, Nutrition and Diet Therapy.** M.B.Saunders Co., USA.
9. Balasubramanian et al., (1998). Adams, A.A., (1990). **Clinical Assessment of Nutritional Status – A Working Manual**, Will and Wilson Publishing, London.
10. Bamji et al (1996), **Textbook of Human Nutrition.** Oxford and IBH Publishing co. Pvt. Ltd. Delhi.
11. Shils. E. M., Shike. M, Ross, A.C, Cabellero B. and Cousins R.J. (2011). **Modern Nutrition in Health and Disease**, 11th Edition, Lippincott Williams and Wilkins, Philadelphia.
12. Mahan, K.L., and Stump, S.E., (1996). **Krauses Food, Nutrition and Diet Therapy** M.B. Saunders Co., USA.

E-LEARNINGRESOURCES

1. www.four-h.purdue.edu
2. www.ingenta.connect.com
3. nal.usda.gov/fnic/lifecycle
4. www.fda.gov/search.html
5. http://epgp.inflibnet.ac.in/Home/ViewSubject?catid=1827

COURSE OUTCOME :

On successful completion of the course the student will be able to

CO No.	CO STATEMENT
CO1	Recall prenatal and neonatal growth and development. Understand the foetal origins of adult disease. Identify the causes of intrauterine growth defects. Interpret the growth chart and analyze the growth and development of infants. Evaluate the nutritional needs of infants. Develop balanced diet charts and low cost supplementary foods.
CO2	Recall the growth and development during childhood. Identify the food and nutrient needs. Implement the development of healthy gut micro biome during childhood. Analyze the factors affecting optimum growth and development. Evaluate the causes of nutritional disorders and methods of treatment. Create innovative and nutrient dense packed lunch menus. Develop diet charts for children with special needs.
CO3	Recall the definition of adolescent. Understand the growth and development of adolescent. Identify their food and nutrient requirements. Recognize the causes for their food habits and irregular meal pattern. Analyze the eating disorders and evaluate the pros and cons of diets. Examine the causes of problems during adolescence. Construct innovative balanced menus.
CO4	Recall the food and nutrient requirements and understand the physiological changes during pregnancy and lactation. Identify the factors influencing fertility and interpret pregnancy outcomes. Discuss the discomforts and complications during pregnancy and lactation. Examine the role of hormones in lactation and evaluate the composition of breastmilk. Explain COVID protocols to be followed during this period. Create balanced diets based on recommended dietary guidelines.
CO5	State the food and nutrient requirements during adulthood and old age. Recognize the need for dietary modifications during this period. Implement the dietary guidelines in creating menu plans. Analyze their constraints and develop strategies to overcome them.

MAPPING OF CO WITH PSO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3
Average	3	3	3	3	3	3

PEDAGOGY:

Lecture, journal reviewing, Assignments, Power point presentations, video presentations.

II YEAR – IV SEMESTER

COURSE CODE 23MHF4D	Core-XIII	T/P	C	H/W
	DISSERTATION WITH VIVA VOCE		6	10

COURSE OBJECTIVES

To enable the student to:

1. Develop skills in conducting are search study
2. Learn the art and science of preparing and presenting are search document.

COURSE OUTLINE :

The structure of the dissertation includes

Unit 1 : Introduction

Unit 2 : Review of Literature

Unit 3 : Methodology

Unit 4 : Results and Discussion

Unit 5 : Summary and Conclusion, Bibliography

COURSE OUTCOMES

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

CO No.	CO STATEMENT
CO1	Develop and search design on a topic relevant to their field
CO2	Prepare a systematic literature review on the topic selected
CO3	Select and execute the most appropriate methodology for the study and provide justification for the choice made.
CO4	Acquire skill in collecting, analyzing, presenting and interpreting data accurately.
CO5	Present findings of the study in a logical and sequential manner and discuss them against a backdrop of available scientific literature and its references in prescribed format and conduct plagiarism check on the document prepared.

MAPPING OF CO WITH PSO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3
Average	3	3	3	3	3	3

II YEAR – IV SEMESTER

COURSE CODE 23MHF4E1	DSE-VI A	T/P	C	H/W
	NUTRITION FOR HEALTH AND FITNESS	T	3	4

COURSE OBJECTIVES

1. To understand the components of health and fitness and the role of nutrition in these.
2. To Make nutritional, dietary and physical activity recommendations to achieve fitness and well-being.
3. Develop ability to evaluate fitness and well-being.

UNIT NO.	CONTENT	HOURS
UNIT I	**Introduction to Nutrition, Health, Exercise and Fitness :** Nutrition, exercise, physical fitness and health and their inter-relationship. Types of exercises and its health benefits.	15
UNIT II	**Review of Different Energy systems for Endurance and Power Activity :** Energy input and output. Calculation of energy expenditure by different methods. Fuels and nutrients to support physical activity Mobilization of ft stores during exercises.	20
UNIT III	**Nutrition in Sports :** Nutritional aspects of macro and micro nutrients in sports. Sports Specific requirement. Pre-game, during and post-game meals.	20
UNIT IV	**Nutritional and Exercise regimes for Management of Obesity :** Critical review of various dietary regimes for weight and fat reduction.	15
UNIT V	**Dietary Supplements and Ergogenic aids :** Definitions, types and use of different ergogenic aids like nutritional, physiological, pharmacological etc and commercial supplements, sports drinks, etc.	20
	TOTAL	90

BOOKS FOR REFERENCE:

1. Mahan, L.K. and Ecott-Stump, S. (2000). **Krause's Food, Nutrition and Diet Therapy.** (10th Ed.)**. International Food.** London: W.B. Saunder Company.
2. Sizer, F. and Whitney, E. (2000). Nutrition – Concepts and Controversies. (8th Ed.). Wadsworth: Thomson Learning.
3. Whitney, E.N. and Rolfs, S.R. (1999). **Understanding Nutrition.** (8th Ed.). West / Wadsworth : An International Thompson Publishing Co.
4. Ira Wolinsky. (1998). **Nutrition in Exercise and Sports.** (3rd Ed.). CRC Press.
5. Parikova, J. (1999). **Nutrition, Physical Activity and Health in Early Life.** Wolinsky: CRC Press.
6. Shils, M.E., Olson, J.A., Shike, N. and Rossa, A.C.(1999). **Modern Nutrition in Health and Disease**. (9th Ed.) Williams and Wilkins.
7. McArdle, W., Katche, F. and Katch, V. (1996). **Exercise Physicology. Energy, Nutrition and Human Performance.** (4th Ed.). Philadelphia: Williams and Wilkins.

JOURNALS :

1. Medicine and Science in Sports and Exercise.
2. International Journal of Sports and Nutrition.

COURSEOUTCOME

On successful completion of the course the student will be able to

CO No.	CO STATEMENT
CO1	Acquire knowledge on Introduction to Nutrition, Health, Exercise and Fitness
CO2	Discuss Review of Different Energy systems for Endurance and Power Activity, Calculation of energy expenditure by different methods and mobilization of ft stores during exercises.
CO3	Select and execute the most appropriate nutritional requirements of macro and micro nutrients during sports.
CO4	Acquire skill in Critical review of various dietary regimes for weight and fat reduction.
CO5	Present findings of the study in types and use of different ergogenic aids like nutritional, physiological, pharmacological etc.

MAPPING OF CO WITH PSO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	2	3	3	3	3	3
CO3	3	3	2	3	3	3
CO4	3	3	3	3	3	2
CO5	3	3	3	2	3	3
Average	2.8	3	2.8	2.8	3	2.8

PEDAGOGY:

Lecture, journal reviewing, Assignments, Power point presentations, video presentations.

II YEAR – IV SEMESTER

COURSE CODE 23MHF4E2	DSE-VI B	T/P	C	H/W
	ORGANIZATION AND ADMINISTRATION OF EARLY CHILDHOOD CARE AND EDUCATION	**T**	**3**	**4**

COURSE OBJECTIVES

The course will enable students to:

- Understand the need and significance of early childhood care and education,
- Understand the policy perspectives on ECCE in India and world,
- Develop knowledge and skills in designing the curriculum for children below six years and
- Develop an insight into the educational thoughts of Indian and western educationists on ECCE.

UNIT NO.	CONTENT	HOURS
UNIT I	**Concept and Significance of ECCE** - Understanding terminologies, "Child", "Childhood", and "Early Childhood Care and Education"· Importance and significance of ECCE .- Developmental perspective, NeuroScience perspective, Human right perspective. Contributions of Thinkers and Educationists in ECCE - educational thoughts of Frobel, John Dewey, Montessori, Gandhi, Tagore and Aurobindo on understanding of programmes for childhood and young children.	**15**
UNIT II	**Early Childhood Curriculum** – Definition and concept of curriculum: Curriculum Approaches – Subject centered, learner centered, community centered. Developmentally appropriate practice (DAP) – definition and core considerations, myths and consequences of developmentally inappropriate ECE practices. Components and essential features of developmentally appropriate ECCE curriculum. Planning a developmentally appropriate curriculum – approaches, key principles and types of plans.	**20**
UNIT III	**Physical arrangements needed for an ideal ECCE centre** – Building, site, safety, space;Furniture – types, shapes, safety. Other equipment – play equipment – selection, use and storage. Setting up the learning environment – indoor area, outdoor area, learning activity corners. Quality Standards as per ECCE policy.	**20**
UNIT IV	**Policies and Programmes in ECCE in India** - ECCE Policy Framework: National Policy on Education (1986), Article 45 in Indian Constitution and 86th Amendment, National Curriculum Framework (2005), National Policy on ECCE (2013) Sustainable Development Goals (SDG); New Education Policy 2020. Programmes and provisions in ECCE in India: Public Sector: ICDS; Rajiv Gandhi Crèche Scheme; ECCE in SSA; Private sector provisions in ECCE; Voluntary Sector initiatives in ECCE.	**15**
UNIT V	Organizational Management and Community Involvement Evaluation of ECCE ECCE professionals- competence, skill and methodology.¬programmes-infrastructure, safety, school¬Maintenance of records. Working with parents and community for continuity of home interactions. Evaluation of pre school participation.	**20**
	TOTAL	**90**

Reference and Textbooks

1. Aggarwal, J. C. (2007). *Early Childhood Care and Education*: Principles and Practices. Shipra: New Delhi.
2. Arni, K. and Wolf G. (1999). *Child Art with Everyday Materials*. TARA Publishing.
3. Fleer, M. (2010). *Early learning and development:* Cultural –historical concepts in play. Cambridge: Cambridge University Press
4. Kaul, V. (2009). *Early Childhood Education Programme*. National Council of Educational Research and Training. Newdelhi.
5. Mohanty, J. Mohanty, B. (1996). *Early childhood care and Education*. Deep And Deep Publication, New Delhi.
6. Morrison, G. S. (2003). *Fundamentals of early childhood education*. Merrill/Prentice Hall:
7. Muralidharan, R. and Banerji.V. (1989) *A Guide Booklet of Nursery* Teachers, New Delhi : NCERT.
8. Swaminathan, M. (1998). *The First five Years*. Sage Publications.
9. Virginia Singh, A. (1995). *Playing to Learn: A training manual for Early Childhood Education*. M. S. Swaminathan Research Foundation.

COURSEOUTCOME

On successful completion of the course the student will be able to

CO No.	CO STATEMENT
CO1	Acquire knowledge on Concept and Significance of ECCE - Understanding terminologies, "Child", "Childhood", and "Early Childhood Care and Education"· Importance and significance of ECCE
CO2	Develop Early Childhood Curriculum, Curriculum Approaches – Subject centered, learner centered, community centered. Myths and consequences of developmentally inappropriate ECE practices. Components and essential features of developmentally appropriate ECCE curriculum.
CO3	Select and execute the Physical arrangements needed for an ideal ECCE centre, Other equipment – play equipment – selection, use and storage. Setting up the learning environment.
CO4	Acquire skill in Critical review of Policies and Programmes in ECCE in India - ECCE Policy Framework: National Policy on Education, National Curriculum Framework, National Policy on ECCE, New Education Policy 2020. Programmes and provisions in ECCE in India.
CO5	Present findings of the study in Organizational Management and Community involvement, Evaluation of ECCE ECCE professional competencies.

MAPPING OF CO WITH PSO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	2	3	3	3	3	3
CO3	3	3	2	3	3	3
CO4	3	3	3	3	3	2
CO5	3	3	3	2	3	3
Average	2.8	3	2.8	2.8	3	2.8

PEDAGOGY:

Lecture, journal reviewing, Assignments, Power point presentations, video presentations.

II YEAR – IV SEMESTER

COURSE CODE 23MHF4S1	PCS	T/P	C	H/W
	HOME SCIENCE FOR COMPETITIVE EXAMINATIONS	**T**	**2**	**4**

COURSE OBJECTIVES

The course will enable students to:

- Understand the need and significance of Food groups and food service techniques,
- Understand the family resources and principles of work simplification,
- Develop knowledge on stages of life span and its importance and
- Enhance knowledge on different terminologies used in textiles like yarn, woven, pattern making, etc.
- Develop an insight into the extension educational thoughts and how communicate this thoughts to rural society.

COURSEOUTCOME

On successful completion of the course the student will be able to

CO No.	CO STATEMENT
CO1	Acquire knowledge on Concept and Significance of Food groups, food pyramid and food service management - Understanding terminologies used in Nutrition and Dietetics, Importance and significance of Diet and Menu Planning for different age groups.
CO2	Develop knowledge on family resources and its management methods, fundamentals of art and design.
CO3	Acquire skill in areas ofTextiles and clothing, Textile Testing and quality control. How to apply principles of art in apparel designing.
CO4	Promote knowledge on Principles of growth and development, care during pregnancy, pre-natal and neonatal development.Children with special needs, care and support, special education, rehabilitation. Children at risk.
CO5	Enhance knowledge on Historical perspectives of extension–genesis of extension education, objectives of extension education and extension service.

UNIT NO.	CONTENT	HOURS
	FOOD SCIENCE AND FOOD SERVICE MANAGEMENT **A.** Food groups – balanced diet, food pyramid, macro and micro nutrients -role of nutrients, nutrient deficiencies and requirements for Indians.Properties of food – physical and chemical properties, Quality evaluation of foods- objectives and subjective, Effects of cooking and processing techniques on nutritional components, food preservation and application. Food pigments and additives, Food standards, microbiological safety of food, HACCP, food packaging. **B.** Nutrition through life span-physiological changes, growth and	

UNIT I	development, nutritional needs and dietary guidelines for adequate nutrition through life cycle. Clinical and therapeutic nutrition, Diet counseling and management.Nutritional assessment-methods and techniques. Sports nutrition, Nutrition InterventionProgrammes,food and nutrition security. **C.**Perspectives of Food Service-Menu planning, food costanalysis, New product development - nano technology, Food service management indifferent institutional level- hospital, educational, social and special institutions.	**20**
UNIT II	**FAMILY RESOURCE MANAGEMENT AND INTERIOR DESIGN** **A.**Management-concept, approaches, management of time, Energy - energy as a resource- conventional and non- conventional sources, renewable /non-renewable energy, energy management, national efforts on energy conservation.Money - family income, types, supplementation, budgeting, household accounts, family savings and investment, space, motivating factors, decision making. Functions of management,Resources-classification, characteristics, resource conservation - Management of natural resources, work simplification techniques.Ergonomics - significance, scope, anthropometry, man, machine, environment relationship, factors affecting physiological cost of work, body mechanics. Human resource management, Entrepreneurship-concept, process, barriers, project planning and appraisal. **B.**Fundamentals of Design – elements of art, principles of design.Colour - dimensions of colour, psychological effects of colour, colour schemes. Furniture and furnishing - historical perspectives, architectural styles, contemporary tends, wall finishes, window and window treatments. Flower arrangement – Types, Principles and steps in preparing flower arrangement and other art objects.	**20**
	TEXTILES AND CLOTHING **A.**Textile terminologies, classification of fibers, yarns and weaves, Identification of fibres and weaves. Manufacturing process of major natural and manmade fibres, properties and their end uses. Different methods of fabric construction-woven, knitted and non woven fabrics, their properties and end uses. Textiles finishes-classification, processing and purposes of finishes. Dyeing and printing-classification, method of block printing, tie and dye, batik, roller printing, screen printing, discharge, heat transfer printing and digitized printing. Traditional textiles of India-embroidered textiles, printed textiles, woven textiles, dyed	

UNIT III	textiles of various regions in India.. Textile Testing and quality control-need of testing, sampling method, techniques of testing fibres, yarn, fabrics and garments. Testing of colour-fastness, shrinkage, pilling and GSM of fabrics. **B.**Body measurements-procedure, need, figure types and anthropometry. Equipments and tools used for manufacturing garments. Types of machines used and their parts. Elements and principles of design and its application to apparel. Illustrations and parts of garments. Pattern making-drafting, draping and flat pattern making techniques, pattern alteration and dart manipulation techniques. Selection of clothing for different age groups in different uses. Care and maintenance of clothing-principles of washing, laundry agents, storage techniques.	**20**
UNIT IV	**HUMAN DEVELOPMENT** **A.** Principles of growth and development, care during pregnancy, pre-natal and neonatal development. Early childhood care and education – activities to promote holistic development. Adolescence and youth: changes, challenges and programs to promote optimal development. Adulthood - characteristics, changing roles and responsibilities.Aging-physical and psychological changes and care needs. **B.**Children and persons with special needs, care and support, special education, prevention of disabilities, rehabilitation. Children at risk-child labour, street children, children of destitute, orphans, child abuse and trafficking. Human rights, rights of children, rights of women, gender roles.Guidance and counseling- across life span and for care givers.	**15**
UNIT V	**EXTENSION EDUCATION AND COMMUNICATION** **A.**Historical perspectives of extension–genesis of extension education and extension systems in India and other countries, objectives of extension education and extension service, philosophy and principles of extension programme development. Programmeplanning steps. Extension methods and materials, Curriculum development and planning for extension education. Non-Formal, adult and lifelong education-historical perspectives, scope, methods and materials used, challenges of implementation and evaluation. Training, skill development and capacity building for human resource development-methods of training. **B.**Community development- perspectives, approaches, community organization,	**15**

	leadership, support structures for community development, Panchyati raj institutions, NGOs and community based organisations. Development programmes in India for urban, rural and tribal population groups- programmes for nutrition, health, education, wage and self employment, women's development, skill development, sanitation and infrastructure. **C.**Basics of communication- nature, characteristics, functions, process, models, elements, principles, barriers, perception, persuasion and empathy, types of communication, levels (settings) of communication transactions, process of listening, communication models and approaches, diffusion and innovation, mass media, social marketing. Role of communication in development- need and importance, development journalism, writing for development-print, radio, television and internet. Organisation/agencies/institutes working for development communication – international/national/state and local.	
	TOTAL	**90**

Reference and Textbooks:

TEXT BOOKS:

1. Srilakshmi B. (2015). **Food Science.** New Age International (P) Ltd Publishers.
2. Avantina Sharma (2017). **Text book of Food Science and Technology.** CBS Publishers and Distributes Ltd. 3rd Edition.
3. Swaminathan A. (2018). **Handbook of Food and Nutrition.** Bangalore Press.
4. SerpilSahin and ServetGulumSumnu. (2006). **Physical Properties of Foods.** Springer Publications.
5. Nickell and Dorsey, (1991). **Management of Family Living**, Willey Eastern Limited
6. Deacon R and Firebaugh F. (1981). **Family Resource Management – Principles and Applications.**Allyn& Bacon. Boston.
7. Sherman A.W. et al (1988).**Managing Human Resources,** South-Western Publication Co Cincinnati.
8. Veena, G.O., Krishana and S. Promila. (2010).**Essential of Ergonomics,** Dominant publishers and distributors
9. Jha, J.K. (2002). **Encyclopaedia of Teaching of Home Science**, Vol.I,II and III . New Delhi: Anmol Publications.
10. **Fashion Sketch Book** – BinaA bling, Fair Child Publications, NewYork: Wardrobe
11. **Fundamentals of Textilesand their Care**- SusheelaDantyagi, 5th edition, orient Longman Ltd., New Delhi.
12. **Inside the Fashion Business**– Heannette A Jarnowet al, MacimilanPublishing Company; New York.
13. **Art and Fashion in Clothing Selection**Mc Jimseyand Harriet, Iowa State University Press, Jowa.
14. Gerard L. Hasenhuett and Richard W. Hartel (2019). **Food Emulsifiers and their Applications.** Springer publications. 3rd edition.

15. Vickie. A. Vaciavik (2021). **Essentials of Food Science.** Springer publications. 5th edition.
16. Swaminathan M. (2015). **Advanced Text Book of Food and Nutrition.**volume-2. Bapco publications.
17. Janet D. Ward and Larry Ward. (2006). **Principles of Food Science.** Stem Publishers. 4th Edition.
18. Bamji, M.S. Rao, N.P. Reddy. V (2003). **Textbook of Human Nutrition,** 2nd Edition New Delhi : Oxford & IBH Publishing co. Pvt. Ltd.
19. Martin Eastwood, (2003). **Principles of Human Nutrition,** New York : Blackwell Wiley Publishing.
20. MirandeLomer, (2014). **Advanced Nutrition and Diet in Gastro Enterology,** ISBN : 97811118872796.
21. Sareen S. Gropper and Lack L. Smith (2013). **Advanced Nutrition and Human Metabolism,** USA :Wardsworth Publishing.
22. Garrow JS, James WPT, Ralph A. (2000). **Human Nutrition and Dietetics.** Churchill Livingstone, NY. 10th edition.
23. Groff L James, Gropper S Sareen.(2000). Advanced Nutrition and Human Metabolism. West / Wadsworth, UK. 3rd edition.
24. Sue Rodwell Williams. (1993). **Nutrition and Diet Therapy.** W.B. Saunders Company London. 7th edition.
25. Whitney, E. N. and C. B..Cataldo. (1983). **Understanding Normal and Clinical Nutrition.** West Pub. S1. Paul.
26. Mahan L.K., Sylvia Escott-Stump. (2000). Krause‟s Food Nutrition and Diet Therapy. W.B. Saunders Company London. 10th edition.
27. Srilakshmi B. (2007). **Dietetics.** K.K. Gupta For New age International Pvt. Ltd. New Delhi Publisher.
28. Antia F.P. And Philip Abraham. (2001). **Clinical Nutrition and Dietetics.** Oxford Publishing Company.
29. Passmore P. And M.A. East Wood. (Digitised in 2010). **Human Nutrition And Dietetics.** Churchill Living Stone.
30. Mudambi S.R. and Rajagopal M.K. (2009). **Fundamentals, Food Nutrition and Diet Therapy.** New Age Publishers. 5th edition.
31. Robinson Ch., M.B. Lawlea, W.L., Chenoweth, And A.E., Carwick. (1990). **Basic Nutrition and Diet Therapy,** Macmillan Publishing Company.
32. Rastogi. D and Chopra. S., (2017). **Textile Science,** Hyderabad: Orient Black-Swan Private Limited.
33. Corbman. B.P., (2005). **Textiles Fiber to Fabric,** (Sixth edition). New Delhi: McGraw Hill International Editions.
34. Kaplan, N.S., (2008). **Textile Fibres,** Chandigarh: Abhishek Publications.
35. Corbman B.P., and Potter.M.D., (1984).**Textiles fiber to fabric**, New York: International Edition, Mc Graw-hill book Co,
36. Pretal.J.J., (1990).**Fabric Science,** (5th edition), New York: Fairchild Publications.
37. Mathews. M., (1896). **Practical's Clothing Construction Part I & II,** Chennai: Cosmic Press.
38. Joseph.H., (2000).**Pattern Making for Fashion Design,** New Dehi: Armstrong Pearson Education.

E-LEARNING RESOURCES:

1. www.nutrition.gov - Service of National agricultural library, USDA.
2. www.nal.usda.gov/fnic -Food and Nutrition information centre.
3. www.healthyeating.org.
4. www.eatrightpro.org.
5. https://www.globalhealthlearning.org.
6. www.fao.org
7. www.wfp.org
8. www.foodrisk.org.
9. http://www.fsis.usda.gov/
10. https://www.fda.gov/food

MAPPING OF CO WITH PSO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	2	3	3	3	3	3
CO3	3	3	2	3	3	3
CO4	3	3	3	3	3	2
CO5	3	3	3	2	3	3
Average	2.8	3	2.8	2.8	3	2.8

PEDAGOGY:

Lecture, Demonstration, journal reviewing, Assignments, Power point presentations, video presentations, Industrial visit.

II YEAR – IV SEMESTER

EXTENSION ACTIVITIES

Credit : 1 **Hours per week : Nil**

Extension Activities will be organized for 1 day in the Fourth Semester. The programme may be organized in any Saturday.

One credit will be allotted for this Extension Activities. The marks allotted for each camp will be 100. Each student participating in the camp will be evaluated internally for 100 marks. The criteria for evaluation of Extension Activities will be as follows:

S. No.	Criteria	Maximum Marks
1.	Interaction with villagers	10
2.	Participation / Attitude towards work	10
3.	Participation in interaction and discussion	10
4.	Knowledge of problems / issues	20
5.	Organising & decision making ability	20
6.	Ability to adjust and work in a team	10
7.	Report Writing	20
	Total	**100**