NATIONAL EDUCATION POLICY
Department of Food and Nutrition, Institute of Home Science,
Dr. Bhimrao Ambedkar University, Agra

Core Courses	Course Title B.Sc. (Home Science) VII SEMESTER/ M.Sc. (Home Science) I Semester	Marks		Total 100	Credit	Course Mapping		
		CIE	UE			EC	EPC	SDC
I	Research Methodology	25	75	100	4		-	-
II	Nutritional Biochemistry-I	25	75	100	4		-	
III	Maternal and Child Nutrition	25	75	100	4		-	-
IV	Applied Nutrition- Health and Fitness	25	75	100	4		-	
V	Nutritional Biochemistry-I (major) Practical	25	75	100	4		-	
VI	Other faculty*	25	75	100	4		-	-
VII	Research project	25	75	100	4		-	-
	Total			700	28			
Core Courses	**Course Title B.Sc. (Home Science) VIII SEMESTER/ M.Sc. (Home Science) II Semester**	**Marks**		**Total**	**Credit**	**Course Mapping**		
		CIE	**UE**			**EC**	**EPC**	**SDC**
VIII	Fundamentals of Statistics	25	75	100	4		-	-
IX	Nutritional Biochemistry-II	25	75	100	4		-	-
X	Advanced Food Science	25	75	100	4		-	-
XI	Public Health Nutrition	25	75	100	4		-	
XII	Advanced Food Science(major)	25	75	100	4		-	
XIII	Research Project	25	75	100	4		-	
	Total			600	24			
Core Courses	**Course TitleB.Sc. (Home Science) IX SEMESTER/ M.Sc. (Home Science) III Semesterr**	**Marks**		**Total**	**Credit**	**Course Mapping**		
		CIE	**UE**			**EC**	**EPC**	**SDC**
XIV	Techniques & Instrumentation in Nutrition Research-Nutritional Biochemistry III	25	75	100	4		-	
XV	Institutional Food Management	25	75	100	4			
XVI	Advanced Nutrition	25	75	100	4		-	-
XVII	Food Microbiology and Food Safety	25	75	100	4		-	-
XVIII	Computer application I n designing(major)	25	75	100		-	-	
XIX	Research Project	25	75	100	4		-	-
	Total			600	24			
Core Courses	**Course TitleB.Sc. (Home Science) X SEMESTER/M.Sc. (Home Science) IV Semester**	**Marks**		**Total**	**Credit**	**Course Mapping**		
		CIE	**End Semester Examination**			**EC**	**EPC**	**SDC**
XX	Advanced Physiology	25	75	100	4		-	-
XXI	Clinical Nutrition with Compulsory Internship	25	75	100	4			
XXII	Food Processing and Preservation	25	75	100	4			

XXIII	Food Preservation techniques(Practical)	25	75	100	4			
XXIV	Nutrition in Critical Care	25	75	100	4			
XXV	Research Project	25	75	100	4		-	
	Total			600	24			
Core Courses P.G.D.R IN SUBJECT		Marks		Total	Credit	Course Mapping		
		CIE	End Semester Examination			EC	EPC	SDC
C 1	Thrust areas of Home Science	25	75	100	4		-	-
C 2	Essentials of Entrepreneurship	25	75	100	4			
C 3	Research Methodology	25	75	100	4		-	-
	Research Project (Qualifying)	25	75	100	4		-	
C 1	Thrust areas of Home Science	25	75	100	4			
C 2	Essentials of Entrepreneurship	25	75	100	44		-	
	Total			600	24			

Mapping of the course to employability/ Entrepreneurship/skill development：
***EC:** **M e m o r a b i l i t y Courses** ***EPC:** **Entrepreneurship Courses** ***SDC:** **Skill Development Courses**

Mapping of the course to Local/ Regional/National/Global need：
***Loc:** **Local Need** ***Reg:** **Regional Need** ***Nati :** **National Need** ***Glob:** **Global Need**

Programme Educational Objectives (PEOs) M.Sc. (H.Sc.) in Food and Nutrition Programme:

The Program Educational Objectives (PEOs) for the M.Sc.(H.Sc.) in Food and Nutrition program describe accomplishments that post graduates are expected to attain within two years after graduation

PEO-1: to prepare graduates with advanced knowledge and skills in the field of food science, nutrition, and dietetics.

PEO-2: To enable students to pursue research career in industry and academia by providing fundamental and practical knowledge in the field of MSc(HomeScience) in Food and Nutrition

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PEO 3: To develop the skills among students to work effectively with healthcare professionals, food industry stakeholders, policymakers, and community organizations to address nutrition-related challenges and promote population health.

PEO 4: To Encourage lifelong learning and professional development among graduates

Programme Outcomes (POs)

The students of M.Sc.(H.Sc.) in Food and Nutrition program will be able to:

PO-1: To acquire knowledge in food science, nutrition and dietetics.

PO-2:To assess the nutritional status of individuals in various life cycle stages and determine nutrition related problems and disease by applying knowledge of metabolism and nutrient functions, food sources and physiological systems in community, hospitals and in any situation.

PO-3: To understand the concepts of food microbiology and food safety.

PO-4 To develop the food products applying the principles of food science and nutrition to meet the challenges of nutritional problems.

PO-5: To conduct the research in different fields of nutrition.

Programme Specific Outcome (PSOs)

After the successful completion of M.Sc.(HSc) Food and Nutrition, the students will able to:

PSO 1: Proficiency in Nutritional Assessment Upon completion of the program, students should be able to conduct comprehensive nutritional assessments of individuals and communities using appropriate tools and methodologies.

PSO 2: Advanced Understanding of Human Nutrition Students should demonstrate an in-depth understanding of human nutrition, including macro and micronutrient requirements, metabolic processes, and the role of nutrition in health and disease prevention.

PSO 3: Application of Food Science Principles Graduates should be proficient in applying food science principles to develop nutritious and safe food products, considering factors such as food composition, processing techniques, and preservation methods.

PSO 4: Critical Analysis of Food Policies and Regulations Students should be able to critically evaluate food policies and regulations at local, national, and international levels, and understand their implications for public health and nutrition outcomes.

PSO 5: Effective Communication and Counseling Skills Graduates should possess effective communication and counseling skills to educate individuals and communities about healthy eating habits, dietary modifications, and nutritional interventions for various health conditions.

PSO 6: Research Proficiency in Food and Nutrition Students should be capable of designing and conducting research studies in the field of food and nutrition, including literature review, data collection and analysis, interpretation of results, and dissemination of findings.

Research Methodology
M.Sc. (Home Science) I Semester
(General, Spl. Grp. 'A', 'B'& 'E')/
B.Sc.(H.Sc.) Semester VII

Course Type: Theory Major CIE – 25 Marks

Credits: 4
Teaching Periods: 4/ week UE – 75 Marks

Course Objectives:

The primary objective is to familiarize students with the fundamental concepts, principles, and processes involved in conducting research. This includes understanding the scientific method, formulating research questions, developing hypotheses, and designing research studies.To learn about different research designs, such as experimental, quasi-experimental, correlational, and qualitative designs.Students learn about different sampling methods, such as random sampling, stratified sampling, and convenience sampling, and their applications in research.

UNIT- I	**Introduction to Research**	**PERIODS**
	1. Meaning, purpose, approaches and scope in various field of Home Science	**2**
	2. Types of Research	**3**
	3. Selection of Research problem: need, relevance and feasibility	**2**
	4. Research Design: meaning, purpose and criteria(Experimental and Observational)	**3**
	5. Quantitative and Qualitative approaches	**2**
UNIT- II	**Research Process**	
	1. Planning the Research	**2**
	2. Defining the Research problem	**2**
	3. Research Objectives: Definition and formulation of hypothesis/objectives	**2**
	4. Review of related literature	**2**
	5. Basics of Sampling: Sampling vs. Complete Enumeration Objectives, Principles and Limitations of sampling, Sampling Techniques, Size and Error	**4**
UNIT-III	**Data Collection Tools**	
	1. Primary and Secondary Data	**1**
	2. Methods and Tools in Data Collection (Schedule, Questionnaire, Interview, Case Study Method etc.)	**4**
	3. Measurement and Scaling Techniques	**4**
	4. Validity, Reliability, Sensitivity of Data Collection Tools	**3**
UNIT- IV	**Report Writing**	
	1. Summary, Conclusion and Recommendations	**3**
	2. Writing References	**2**
	3. Writing Process of Research Report: Formal Style of writing, Preface, Chapterization, Headings, Tables and Figures, Appendices, Bibliography and Acknowledgement	**7**

References:

1. C. R. Kothari: Research Methodology- Method and Techniques
2. R. Kumar: Research Methodology: A step by Step Guide for Beginners
3. M. H. Gopal: Introduction to Research Methodology for Social Sciences
4. Good, Carter, Scales and Douglas: Methods of Research

SESSIONAL WORK

- Prepare a research plan of any field of Home Science.
- Prepare a Schedule/Questionnaire of the related topic using scaling techniques.
- Gathering information from pilot survey and make a sample master chart for analysis.

Course Outcomes

After completing this course, student is expected to learn the following:

CO1: To understand the significance of Research Methodology in Home Science Research.
CO2: To study the types, tools and Methods of Research and develop the ability to construct data appropriate to the Research Design.
CO3:To develop skills for preparation of research proposal and writing report

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	1	2	1	1	3	2	2	2	2	2	3
CO2	2	2	1	2	3	3	2	1	2	1	3
CO3	2	2	2	2	3	2	2	2	2	2	3

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100%=3

Paper. II
Nutritional Biochemistry I
M. Sc. (Home Science) Gen and Spl. Group 'B' I Semester
B.Sc. (H.Sc.) Semester-VII

Course Type: Theory Major CIE – 25 Marks

Credits: 4
Teaching Periods: 4/ week UE – 75 Marks

Course Objectives:

The course aims to equip students with the knowledge and analytical skills necessary to understand the complex interactions between nutrients and biochemical pathways, and to apply this understanding to promote health, prevent disease, and optimize nutritional interventions across the lifespan.

	Unit-I -	**Periods**
1.	Definition, objectives, scope and importance of biochemistry and its relation to nutrition	**1**
2.	**Carbohydrates-** • definition, classification, and properties of Glycoproteins,Proteoglycans • glycolysis, kreb's cycle, and its significance as amphibolic pathway, • glycogenesis, glycogenolysis, cori cycle and blood sugar regulation.	**10**
	Unit-II -	
1.	Definition, classification of lipids	**2**
	Metabolism of Lipids- • Biosynthesis of fatty acids • Beta oxidation theory with energetic • Ketosis, formation and utilization of ketone bodies.	**6**
2.	**Proteins**	
	Definition, classification. • Structure and properties of proteins. • Essential and non essential amino acids.	**5**
	Metabolism of Proteins – • Urea cycle and its regulation. • Lipoproteins- types, composition ,role and significance in And its relationshipwith lipid transport.	
	Unit-III-	
1.	**Enzymes-** Definition, types and classification of enzymes	**3**
2.	Coenzymes, specificity of enzymes, isozymes, enzyme kinetics including factors affecting velocity of enzymes catalysed reaction. Enzyme Inhibition	**4**
3.	Enzymes in differential diagnosis of diseases and their clinical significance	**2**
4.	Allosteric Enzymes	**1**
	Unit-IV-	
1.	**Nucleic Acids -** Classification, composition, and function of nucleic acids	**2**
2.	Structure and properties of nucleosides, nucleotides	**2**
3.	DNA, RNA (mRNA, tRNA, rRNA)	**3**

4.	Replication, Transcription, Protein biosynthesis	**6**
5.	Genetic code.	**1**

Reference books-

1. General biochemistry by Frutton and Simmond.
2. Text book of Biochemistry by West and Todd.
3. Introduction to Modern Biochemistry by Karlson.
4. Principles of Biochemistry by White Handler and Smith.
5. Biochemistry by Kleiner and Orten.
6. Hawk's Physiological Chemistry by Oser.
7. Review of Physiological Chemistry by H.A. Harper.
8. Essentials of food and Nutrition Vol.-I and II by M. Swaminathan.
9. Biochemistry by S.K. Dasgupta. Vol. I, II, III.
10. Essentials of Biochemistry by Dr. M.C. Pant.
11. Biochemistry by Virendra Kumar Shukla.
12. A Text Book of Biochemistry by S.P. Singh.
13. Chemical Analysis- An Instrumental Approach by A.K. Srivastava, P.C. Jain. S. Chand & Company Ltd.
14. Principles of Biochemistry by Leneinger, D.L. Nelson, M.M. Cox.
15. Instrumental methods of chemical analysis by B.K. Sharma.

Sessional Work

1. Seminar presentation on any topic from syllabus.
2. Academic assessment through short and long questions.
3. Discussions on role of nutrients in biochemistry.

Course Outcomes

After completing this course, student is expected to learn the following:

CO1: To augment the biochemistry knowledge acquired and understand the significance of Biochemistry in Home Science research.

CO2:To understand the mechanisms adopted by the human body for regulation of metabolic Pathways

CO3: To become proficient for specialization in nutrition. Understand integration of cellular level metabolic events to nutritional disorders and imbalances.

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	1	1	2	2	2	2	1	2	3
CO2	2	2	1	2	2	1	2	2	1	1	2
CO3	1	1	1	2	2	2	2	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper- III
Maternal and Child Nutrition
MSc. Food and Nutrition SPL Group 'B' / Group 'A' I Semester/ B.Sc. (H.Sc.) Semester-VII

Course Type: Theory Major CIE – 25 Marks

Credits: 4
Teaching Periods: 4/ week UE – 75 Marks

Course Objectives:

This course focuses on providing students with knowledge and skills related to promoting optimal nutrition and health outcomes for mothers, infants, and children. This subject typically covers various aspects of nutrition during pregnancy, lactation, infancy, childhood, and adolescence. Here are some common objectives of Maternal and Child Nutrition:

CONTENTS

UNIT-I	**PREGNANCY**	**PERIODS**
	1. Pregnancy: The period of physiological stress	2
	2. Physiological changes during pregnancy	1
	3. Nutrition during pregnancy – Nutrient, requirement, diet & dietary pattern	4
	4. Maternal Nutrition&foetal outcome- pre pregnancy weight and foetal outcome, BMI , Weight gain during pregnancy	4
	5. Risk factors during pregnancy	1
UNIT- II	**LACTATION**	
	1. Breast Feeding- Colostrum, composition and importance, initiation of breast feeding and duration, advantages of breastfeeding	3
	2. Nutrition needs of lactation	1
	3. Diet and Dietary pattern for lactating woman	2
	4. Effect of maternal malnutrition on milk output and quality of milk	1
	5. Introduction of complementary foods- initiation and management	2
	6. Infant milk substitute act, BPNI (Breast feeding promotion Network in India)	1
	7. Management of pre-term, low birth weight babies and IUGR	1
UNIT-III	**INFACNCY, CHILDHOOD AND ADOLESCENCE**	
	1. Importance of focussing health & nutrition interventions in first 1000 days of life & improving delivery of key nutrition interventions, its evidence, impact, significance for controlling under nutrition & new government initiatives (IYCF- Infant and young Child feeding practices, IGMSY- Indira Gandhi Matratv Suraksha Yojana, Janani Suraksha Yojana)	2
	2. Nutritional requirements during infancy, early childhood, childhood and adolescence with special reference to girl child	6
	3. Diet for preschool child, nutritional deficiency diseases and corrective measures	4
	4. Dietary management of common childhood diseases	2
UNIT-IV	**GOVERNMENT PROGRAMMES AND NUTRITION COMMUNICATION**	
	1. Problems in	4

	improving micronutrient deficiencies in children, Pregnant / Lactating women and adolescent girls: issues, weaknesses and newer initiatives of government (Kishorishakti, SABLA), way forward	
	2. School health programs in India: Current status, bottlenecks	2
	3. School lunch programmes	2
	4. Efficient methods of teaching principles of nutrition to children & mothers	2

References:

1. UNICEF Publications (State of World's Children, tracking maternal & child health, countdown 2015 etc.)
2. Global Strategy for Infant & Young child feeding by WHO & UNICEF,2003.
3. National IYCF Recommendations, 2006, Ministry of Women & Child Development, GOI, New Delhi.
4. Mapping India's Children (2004), UNICEF in Action.
5. Nita Dalmiya, Ian Darnton Hill, Werner Schultiuld (2009); Multiple micronutrient supplementation during pregnancy in developing country settings. Food & Nutrition Bulletin supplement 30(4).2009
6. Wallace, H.M., Giri, K. (1990). Healthcare of women and children in developing countries,3rd party publishing co. Oakland.
7. Michel Dibble and VpulSenaratu (2010). Special section on IYCF practices in 4 countries in South Asia: S.Asia infant feeding network FN Bulletin 31(2) 291-375, June 2010.
8. Indian council of Medical Research. Nutrient requirements & recommended dietary allowances for Indians (2009).
9. Indira Gandhi National Open University. School of Continuing Education (2012). Childhood Nutrition: Basic Concepts and Physiological requirements- Course 1.

	SESSIONAL WORK
.	lan diet for pregnant and lactating women
.	lan and prepare nutrient dense, complementary foods for 6-12 month old infants
.	lan and prepare diet for an infant
	lan low cost recipe for Balwadi and Aanganwadi and school lunch programmes
	lan diet for deficiency diseases and common childhood illnesses
	lan diet for different age groups of children & adolescents

Course Outcomes:

After completing this course, student is expected to learn the following:

CO1: To understand nutritional demands during pregnancy and lactation.

CO2:To acquaint the students with different programs running for controlling undernutrition in infants and mothers.

CO3:To understand nutritional needs during infancy, childhood and adolescence.

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	3	1	2	2	2	1	2	2	1	2
CO2	2	2	1	2	2	2	1	2	2	2	2
CO3	3	3	1	2	2	2	2	2	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper- IV
Applied Nutrition - Health and Fitness
MSc. Food and Nutrition SPL. Grp 'B' I Semester/
B.Sc. (H.Sc.) Semester-VII

Course Type: Theory Major CIE – 25 Marks

Credits: 4
Teaching Periods: 4/ week UE – 75 Marks

Course Objectives:

The course equips students with the knowledge and skills necessary to promote health, enhance fitness, and optimize nutrition for individuals and communities.

CONTENTS

UNIT -I	**ANTIOXIDANTS IN HEALTH & DISEASE**	**PERIODS**
1.	Effect of oxidants on Macromolecules- Carbohydrates, proteins, lipids , nucleic acids.	3
2.	Nutrient antioxidants with potent health effects	2
3.	Non- Nutritive food components with potential effects (Flavonoids- polyphenols and tannates, phytoestrogens, cyanogenic compounds)	2
4.	Pre and Probiotics	2
5.	Foetal origin of Non-communicable disease	1
6.	Nutrigenomics- the future of Nutrition care for health management, treatment and prevention of diseases.	2
UNIT-II	**GERIATRIC NUTRITION- MULTIFACETED ASPECT OF AGEING**	
1.	Ageing process- changing demographic trends, theories of ageing	3
2.	The ageing process- physiological, biochemical and body composition changes	3
3.	Health and Nutritional problems of the elderly	2
4.	Nutritional requirements and dietary guidelines	2
5.	Community geriatrics- Dimensions, issues and solutions.	2
UNIT-III	**NUTRITIONAL MANAGEMENT- HEALTH & FITNESS**	
1.	Definitions, components and assessment criteria of- - Specific fitness - Health status	2
2.	Holistic approach to management of fitness and health - energy input and output - diet and exercise - effect of specific nutrients on work performance and physical fitness - nutrition, exercise, physical fitness and health inter-relationships	 1 1 3 3
3.	Alternative systems for health and fitness like Ayurveda, yoga, meditation, vegetarianism and traditional diets.	2
UNIT- IV	**NUTRITION IN SPORTS**	
1.	Physiological aspects- Metabolic changes during sports activity	2
2.	Energy systems for endurance and power activity	2
3.	Fuels for muscle contraction, Nutritional requirements for sports: Pre game, during and post game meal (Short-duration, endurance)	4
4.	Water & Electrolyte balance and replenishments	2
5.	Erogogenic aids, sports drink, uses and abuse of dietary supplements	2

References:

1. Shils ME, Olson JA and Shike N (1994). Modern Nutrition in Health & Disease. 8th Edition, Vol I and II, Philadelphia Lea and Febiger.
2. Bagchi K and Puri S (1999). Diet and Ageing: Exploring some facts. Society of Gerontological research and HelpageIndia,New Delhi.
3. Parizkova J (1997). Nutrition, physical activity and health in early life. Ed. Wolinsky, I, CRC press.
4. McArdle W, Katch F, Katch V (1996). Exercise physiology, exercise energy, nutrition and human performance. 4thEditiion. Williams and Wilkins,Philadelphia.
5. Indian Council of Medical Research (2000). Nutrient Requirements and Recommended Dietary Allowances for Indians: A report of the expert group of the ICMR, New Delhi.
6. Hickson JH (2000). Nutrition for exercise & sport. CRC Press. 2nd Edition.
7. Mahan, L.K and Escott Stump .S. (2008). Krause's Food & Nutrition Therapy.12th Ed. Saunders-Elsevier.
8. Ira Wolinsky (Ed.). Nutrition in Exercise & Sports.3rd Edition.

Journals:

1. Medicine and Science in sports in exercise
2. International Journal of Sports Nutrition
3. Journal of Applied Nutrition

	SESSIONAL WORK
.	Market Survey for commercial nutritional products for physical fitness & sports performance available in India
.	Ayurveda Cooking
.	Yoga and Pranayaam
.	Vegetarian , Vegan and traditional Diets
.	Diet for different sports activities- Endurance & power

Course Outcomes:

After completing this course, student is expected to learn the following:

CO1: To understand about the functional benefits of foods for health and fitness.

CO2:To understand the dietary management of geriatrics

CO3: To understand the physiological and nutritional demands during different sports activities.

Course Mapping:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	**PSO 6**
CO1	**3**	**2**	**2**	**1**	**2**	**1**	**2**	**2**	**3**	**2**	**2**
CO2	**2**	**2**	**1**	**2**	**2**	**2**	**2**	**1**	**2**	**3**	**1**
CO3	**2**	**2**	**1**	**2**	**2**	**2**	**1**	**2**	**2**	**2**	**1**

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100%=3

Paper. V
Nutritional Biochemistry I
M. Sc. (Home Science) Gen and Spl. Group 'B' I Semester/
B.Sc. (H.Sc.) Semester-VII

Course Type: Practical Major

CIE – 25 Marks
UE – 75 Marks

Credits: 4
Teaching Periods: 4/ week

Course Objectives:

This course helps to understanding the biochemical processes involved in nutrient metabolism, their roles in human health, and the implications for disease prevention and treatment. Here are some specific objectives.

Practical: - Interactive periods /week.

1. Qualitative test for reducing and non reducing sugars, fat and proteins
2. Separation of water and non water soluble protein from soybean and Bengal gram flour.
3. Estimation of cholesterol.
4. Determination of acid value of an oil/ fat.
5. Quantitative estimation of sugars.
6. Estimation of soluble protein by Biuret method.
7. Simple test of sterol.

Course Outcomes

After completing this course, student is expected to learn the following:

CO1:To augment the biochemistry knowledge acquired and understand the significance of Biochemistry in Home Science research.
CO2:To understand the mechanisms adopted by the human body for regulation of metabolic Pathways
CO3:To become proficient for specialization in nutrition. Understand integration of cellular level metabolic events to nutritional disorders and imbalances.

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	1	1	2	2	2	2	1	2	3
CO2	2	2	1	2	2	1	2	2	1	1	2
CO3	1	1	1	2	2	2	2	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper VI

(From Other Faculty) As per the University list

Course Type: Minor

CIE – 25 Marks
UE – 75 Marks

Credits: 4
Teaching Periods: 4/ week

*Faculty of Linguistic, Faculty of computer, Faculty of Management, Faculty of Basic Science

Course objectives:

This course comprehend the fundamental elements of language, including phonetics, phonology, morphology, syntax, and semantics and also improve communication skills, including writing, speaking, listening, and reading comprehension, in both native and non-native languages.

Course outcome:

After completing this course, student is expected to learn the following:

CO1:Students should develop proficiency in the target language, including speaking, listening, reading, and writing skills. This proficiency level may vary depending on the level of the course (e.g., beginner, intermediate, advanced).

CO2:To Understanding of grammar rules and syntax structures within the language being studied.

CO3: Students learn to identify patterns, structures, and rules within language and understanding how language functions helps students become more effective communicators.

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	1	1	1	1	1	2	1	1	1	2	1
CO2	2	1	1	1	1	2	1	1	1	1	1
CO3	1	1	1	2	2	2	1	2	1	2	1

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper – VII
Research Project
M. Sc. (Home Science) I Semester
(General, Grp. 'A', Grp. 'B' and Grp. 'E')/
B.Sc.(H.Sc.) Semester VII

CIE – 25 Marks
UE – 75 Marks

Credits: 4

Course objectives:
Research projects often aim to contribute to the existing body of knowledge within a particular field by discovering new information, insights, or theories.

Course Content:

1. Identification of research problem
2. Preparation and finalization of synopsis

Course outcomes:
CO1: Demonstrate advanced critical research skills, to establish links between theory and methods within their field of study

CO2: Acquire research skills to develop a research proposal, understand protocol, design and manage a piece of original project work

CO3: Help to develop in-depth knowledge of the major subject/field of study, including deeper insight into current research

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	1	1	2	1	1	2	1	1	1
CO2	2	2	1	2	2	2	2	2	1	2	3
CO3	1	1	1	2	2	3	2	2	2	2	3

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Abbreviations:
CIE: Continuous Internal Evaluation **UE:** University Exam

Paper – VIII
Fundamentals of Statistics
M.Sc. Spl (Grp. 'A') /(Grp. 'B') / (Grp. 'E')
M.Sc. (Gen.) II Semester/
B.Sc. (H.Sc.) Semester-VIII

Course Type: Theory Major CIE – 25 Marks

UE – 75 Marks

Credits: 4
Teaching Periods: 4/ week

Course Objectives:

The primary objective is to familiarize students with the fundamental concepts, principles, and processes involved in conducting research. This includes understanding the scientific method, formulating research questions, developing hypotheses, and designing research studies. And Students learn about different sampling methods, such as random sampling, stratified sampling, and convenience sampling, and their applications in research.

UNIT- I	**Introduction to Statistics**	**PERIODS**
	1. eaning of Statistics and its scope in Home Science and other field of inquiry	**2**
	2. rocessing of Data: Editing, Classification and Coding of Data	**3**
	3. abulation of Data	**2**
	4. iagrammatical and Graphical representation of data: Significance of difference between Diagram and Graph, Types of Diagram and Graph (Bar Diagrams, Histogram, Polygon, Ogives)	**3**
	5. ormation of Discrete and Continuous Frequency Distribution	**2**
UNIT- II	**Statistical Measures**	
	1. easures of Central Tendency (Mean, Median, Mode, Quartiles, Deciles, Percentiles)	**6**
	2. easures of Dispersion/Variation (Range, Mean and Quartile Deviation, Standard Deviation, Coefficient of Variation)	**6**
UNIT- III	**Correlation, Regression and Association of Data**	
	1. imple Correlation for Grouped and Ungrouped Data (Karl Pearson's , Spearman Rank Correlation), Basic concepts of Partial and Multiple Correlation	**5**
	2. Simple Linear Regression for Grouped and Ungrouped Data	**5**
	3. easures of Association	**2**

UNIT-IV	**Test of Significance**	
	1. ypothesis, its type and error, Level of Significance, Critical Region, One Tailed and Two Tailed Test	**2**
	2. arge Sample Test: One sample and two sample test for population Mean and Proportion	**2**
	3. mall Sample Test: Applications of t- test (for one sample and two problems)	**3**
	4. hi Square Test and its applications	**2**
	5. - Test and its applications	**3**
	Computer Applications in data Analysis	
	• Use of Statistical Software in data analysis	

References:

1. Hellan M. Walker.: Elementary Statistical Methods
2. Sharma. Choudhary & Gupta.: Descriptive Statistics
3. Elhance. D.N.: Elementary Statistics
4. S. P. Gupta : Statistical Methods
5. Shukla and Sahai: Principles of Statistics

Sessional Work

- Summarization and Presentation of data using tables and graphs.
- Applications of Statistical Techniques to data analysis and interpretation of data.
- Applications of z, t F and Chi-Square test in hypothesis testing.
- All the above will be done using Statistical Softwares.

Course Outcomes

After completing this course, student is expected to learn the following:

:

CO1: To understand the role of Statistics in Research.

CO2: To apply Statistical Techniques to Research Data for analyzing and interpreting data meaningfully.

CO3:To understand the use of Statistical Software in the analysis of data.

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	2	2	1	1	3	2	1	2	1	2	3
CO2	2	2	1	2	3	1	2	2	1	1	2
CO3	2	3	1	2	3	2	1	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper-IX
Nutritional Biochemistry II
M. Sc. (Home Science) Spl. Group 'B' II Semester
B.Sc. (H.Sc.) Semester-VIII

Course Type: Theory Major

CIE – 25 Marks
UE – 75 Marks

Credits: 4
Teaching Periods: 4/ week

Course Objectives:

The course aims to equip students with the knowledge and analytical skills necessary to understand the complex interactions between nutrients and biochemical pathways, and to apply this understanding to promote health, prevent disease, and optimize nutritional interventions across the lifespan.

	UNIT-I	**Periods**
1.	**Water**, electrolyte and acid –base balance	**3**
2.	**Vitamins**: Structure and biochemical properties of water soluble and fat soluble vitamins and their coenzyme activity	**4**
3.	**Minerals –** Biochemical role of inorganic elements –calcium,phosphorous,iron	**3**
	UNIT-II	
1.	**Hormones-** Modes of Hormones action and biological role of hormones of pituitary, adrenal cortex and medulla, thyroid, parathyroid, pancreas.	**6**
2.	**Concepts of energy expenditure and their application-** • Units of energy measurement of energy expenditure by direct and indirect calorimetry • Calculation of non protein respiratory quotient and its conversion to quantity of carbohydrate and fat (in grams) metabolised. • Determination of amount of protein metabolised and calculation of total heat production of the diet, basal metabolism, BMR and its measurement • Determination of amount of protein metabolised and calculation of total heat production of the diet, basal metabolism, BMR and its measurement • SDA of food and its interpretation, calculation of energy expenditure of an average reference man and woman, regulation of energy balance	**6**
	UNIT-III	
1.	**Inborn errors of metabolism-**	
	• Disorders of amino acid metabolism- Albinism, Alkaptonuria, Maple syrup urine diseases, Tyrosinemia, Phenylketonuria. • Disorders of carbohydrate metabolism- Pentosuria, Fructosuria, Hyperglycinemia, Galactosaemia, hereditary disaccharide (sucrose and maltose) tolerance • Disorders of lipid metabolism –Gaucher's disease, Niemann pick disease, Fabry's disease.	**4** **4** **3**
2.	**Bioenergetics**: Electron Transport Chain, oxidative Phosphorylation and synthesis of ATP	**3**
	UNIT-IV	
1.	**Applied instrumentation in biochemistry-**physiochemical principles and methodology-colorimetry, photometry, flourimetry, flame photometry and atomic absorption meter	**6**
2.	**Introduction to functional biochemistry of liver**- A brief description of liver function tests	**3**

3.	**Introduction to functional biochemistry of Kidney** - A brief description of **Kidney** function tests	**3**

Sessional work:

1. Estimation of Ascorbic Acid.
2. Estimation of moisture, fat, ash calcium, phosphorous and iron.
3. Buffers- preparation of buffers. Determination of pH of unknown solution.
4. Estimation of protein by Lowry's method.
5. Estimation of protein by Microkjeldahl method.
6. Estimation of blood sugar.
7. Estimation of lipid profile (total cholesterol, triglyceride, HDL, LDL, VLDL Cholesterol).

Reference books-

1. General biochemistry by Frutton and Simmond.
2. Text book of Biochemistry by West and Todd.
3. Introduction to Modern Biochemistry by Karlson.
4. Principles of Biochemistry by White Handler and Smith.
5. Biochemistry by Kleiner and Orten.
6. Hawk's Physiological Chemistry by Oser.
7. Review of Physiological Chemistry by H.A. Harper.
8. Essentials of Food and Nutrition Vol. I and II by M. Swaminathan.
9. Biochemistry by S.K. Dasgupta. Vol. I, II, III.
10. Essentials of Biochemistry by Dr. M.C. Pant.
11. Biochemistry by Virendra Kumar Shukla.
12. A Text Book of Biochemistry by S.P. Singh.
13. Chemical Analysis- An Instrumental Approach by A.K. Srivastava, P.C. Jain. S. Chand & Company Ltd.
14. Principles of Biochemistry by Leneinger, D.L. Nelson, M.M. Cox.
15. Instrumental Methods of Chemical Analysis by B.K. Sharma.
16. Nutrition and diet therapy- Sheel Sharma, Pee,pee, publishers, New Delhi-2013
17. Experimental and techniques in Biochemistry 2007, galgotia Publishers, New Delhi.

Course Outcomes:

After completing this course, student is expected to learn the following:

CO1:To understand integration of cellular level metabolic events to nutritional disorders

CO2:To familiarize with the applications of the analytical techniques.

CO3:To comprehend better the principles involved in different methods of investigation.

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	2	2	1	1	2	2	2	2	1	2	2
CO2	2	2	1	2	2	1	2	2	1	1	2
CO3	1	1	1	2	2	2	2	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper-X
Advanced Food Science
MSc. Food and Nutrition Spl.Group 'B'
MSc. General II Semester/
B.Sc. (H.Sc.) Semester-VIII

Course Type: Theory Major
Credits: 4 CIE – 25 Marks
Teaching Periods: 4/ week UE – 75 Marks

Course Objectives

This course aims to provide students with a deeper understanding of various aspects of food science beyond the basics and exploring the process of developing new food products from concept to commercialization. Integrating knowledge of food science, consumer preferences, market trends, and regulatory requirements to innovate and create successful food products.

CONTENTS

UNIT-I	**Colloids and Carbohydrates in Food**	**PERIODS**
	1. Introduction to food science.	1
	2. Physical & Chemical properties of foods-Changes occurring on cooking and storages.	2
	3. Colloids – Properties denaturation of proteins, gelatinisation, gel formation, emulsions, foams, browning reactions enzymatic and non-enzymatic.	4
	4. Sugar Cookery: Stages of cookery, fondants, fudges, caramels and brittles, crystallisation of sugar.	2
	5. Starch Cookery: Gelation, factors affecting gelation, starch as thickener, different sources of starch and their properties cereals and millets-their milling and parboiling.	3
UNIT-II	**Proteins and Fats in Food**	
	1. Protein Cookery (a) Properties of milk protein, other milk products- curds, evaporated, spray dried and condensed milk, Cheese, Khoya, Their use in food preparations. (b) Cereals, grams and dals-Effect of soaking, germination & fermentation on cereals and pulses, properties of gluten, gluten formation and the factors affecting it. (c) Eggs-Properties of egg-proteins & uses in egg preparations, egg as binding, foaming and emulsifying agent mayonnaise preparation. (d) Meat-Postmortem changes, changes on cooking, fish types, changes during heat treatment.	3 3 3 2
	2. Fats & Oils: Properties, smoking points, melting point, hydrogenation, shortening effect. Changes an Storage, rancidity, oxidative and hydrolytic, whipped cream as double emulsion, different commercial products and their uses.	3
UNIT-III	**Vegetables & Fruits, Sensory Evaluation**	

	1. Vegetables & Fruits: Structure of vegetable tissues, starch, sugars, pectic substances, celluloses and their effect on texture and palatability. Plant pigments, plant enzymes, enzymatic browning, use of plant enzymes for textural changes in foods eg. Effect on meat.	4
	2. Sensory evaluation a) Selection of panel of judges b) Types of tests c) Judging Objective methods of measurement of: a) Colour b) Texture	2 2
UNIT-IV	**New Product Development**	
	a) Food Additives: Definition, importance, classification & uses	2
	b) Leavening agents : Importance, classification, nature & use	2
	c) Food product development: Definition, factors affecting product development and health concerns.	3

References:

1. Charley, H. (1982): Food Science (2nd Edition), John Wiley and Sons, New York.
2. Potter, N. and Hotchkins, J.H. (1996): Food Science, 5th Edition, CBS Publishers and Distributors, New Delhi
3. Belitz, H.D and Geosch , W (1999): Food Chemistry, 2nd Edition, Springer, New York
4. Manay, N.S and ShadarsSharaswamy , M .1987. Food ,Facts and Principles. Wiley Eastern Ltd, New Delhi.
5. Srilakshmi , B.2001. Food Science. New Age International Pvt Ltd. 2nd Edition.
6. Meyer ,L.H.Food Chemistry, Reinhold Book Corporation, New York.

Sessional Work

1. Seminar presentation on any topic from syllabus.
2. Academic assessment through short and long questions.
3. Discussions on role of nutrients in food science.

Course Outcomes

After completing this course, student is expected to learn the following:

CO1:Enabling students to comprehend the changes that occur in the physiochemical properties of food stuffs during food preparation.
CO2:Enabling the students to understand and apply the various techniques in the quality evaluation of foods.
CO3:Imparting awareness on the concept of 'food product development'

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	2	2	1	1	2	2	2	2	1	2	3
CO2	2	2	2	2	2	1	2	2	1	1	2
CO3	2	1	1	2	2	2	2	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper-XI
Public Health Nutrition
MSc. Food and Nutrition Specialization GROUP 'B' II Semester/ B.Sc. (H.Sc.) Semester-VIII

Course Type: Theory Major

CIE – 25 Marks
UE – 75 Marks

Credits: 4
Teaching Periods: 4/ week

Course Objectives:

The course aims to equip students with the knowledge, skills, and competencies needed to promote population health, prevent nutrition-related diseases, and address nutritional disparities through evidence-based interventions and policies that improve dietary behaviors and food environments.

CONTENTS

UNIT - I	**PUBLIC HEALTH NUTRITION & HEALTH CARE SYSTEM**	**PERIODS**
	1. Aim, scope and content of public health nutrition	2
	2. Current concerns in public health nutrition: An overview	2
	3. Role of Public health nutritionists in National Development - **- Health-** definition, dimensions, determinants, indicators - - Community health care	4
	4. National Health care delivery system	4
UNIT- II	**PUBLIC HEALTH ASPECT OF UNDER NUTRITION**	
	1. Aetiology, public health implications, prevention and community based management of PEM, Severe acute malnutrition	6
	2. Micronutrient deficiencies of public health significance	6
UNIT-III	**FOOD AND NUTRITION SECURITY**	
	1. Concepts and definitions of food and nutrition security at National, regional , household and individual levels.	4
	2. Public sector programmes for improving food and nutrition security	6
	3. National Plan of Action on Nutrition	2
UNIT-IV	**BEHAVIOUR CHANGE COMMUNICATION FOR NUTRITION AND HEALTH PROMOTION**	
	1. Planning of communication strategies for behaviour change programme. - Stakeholders in nutrition promotion. - Developing nutrition education plan - Identifying communication strategies and approaches for health promotion (e.g social marketing) - Designing nutrition and health messages, selecting communication channels, developing and field testing of communication materials	 2 2 2 4
	2. Ethics in Nutrition and Health Communication	2

References:

- Achaya,K.T. (Ed) (1984). Interface between Agriculture, Nutrition and Food Science. The United National University.
- Beaton, G.H and Bengoa, J.M (Eds) (1996) . Nutrition in Preventive Medicine, WHO.
- Gibney M.J., Margetts,B.M., Kearney, J.M. Arab, I., (Eds)(2004). Public health Nutrition, NS Blackwell publishing.
- National consensus workshop on Management of SAM children through Medical Nutrition Therapy (2009)- Compendium of scientific publications Volume I & ii. Jointly organised by AIIMS, SitaramBhartia Institute

of Science and Research, IAP (subspeciality chapter on Nutrition, New Delhi. Sponsored by DBT.
- Park, K. (2009). Parks Textbook of Preventive and Social Medicine, 20th Edition, Jabalpur. M/S Banarsidas
- Gopalan,C and Kaur, S. (Eds) (1993). Towards better Nutrition , problems and policies. Nutrition Foundation of india.
- National Nutrition Policy, GOI, 1993.
- National Plan of Action on Nutrition, GOI, 1995.
- Public Health Communication: Evidence for Behaviour change by Robert C.Hornik (2002) by Lawrence Erlbaum Associates, Inc.
- Communication and Health : Systems and Applications. Edited by Eileen Berlin Ray and Lewis Donohew(1990) by Lawrence Erlbaum Associates, Inc.
- Designing health messages: Approaches for communication Theory and Public Health Practice ;Editors : Edward Maibach and Roxanne Louiselle Parrott (1995) by Sage Publications, Inc.

	Sessional work
1.	Planning and preparation of diet/dishes for PEM, VAD and IDA.
2.	Field Visit to ongoing national nutrition programmes
3.	Assessment of Nutritional problem in an identified community and their determinants in different population groups through analysis of secondary data (such as NSSO, NFHS data etc)
4.	Planning of a communication strategy for a nutrition education programme in the community; field testing of messages, materials and methods

Course Outcomes

After completing this course, student is expected to learn the following:

CO1:To understand the concept of public health nutrition.

CO2:To gain knowledge regarding national/ public sector policies and programs for improving food and nutrition security.

CO3: To plan, implement and evaluate behavior change communication for promotion of nutrition and health among the vulnerable groups.

Course Mapping:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	**PSO 6**
CO1	**3**	**2**	**1**	**1**	**2**	**2**	**2**	**2**	**1**	**2**	**3**
CO2	**2**	**2**	**1**	**2**	**2**	**1**	**2**	**2**	**1**	**1**	**2**
CO3	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**1**	**2**	**2**	**2**

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper -XII
Advanced Food Science
MSc. Food and Nutrition Spl.Group 'B' II Semester
B.Sc. (H.Sc.) Semester-VIII

Course Type: Practical Major
Credits: 4
Teaching Periods: 4/ week

CIE – 25 Marks
UE – 75 Marks

Course Objectives

This course aims to provide students with a deeper understanding of various aspects of food science beyond the basics and exploring the process of developing new food products from concept to commercialization. Integrating knowledge of food science, consumer preferences, market trends, and regulatory requirements to innovate and create successful food products.

	PRACTICALS
1.	Experience in training for taste perception & thresh holds, hedonic scale for attributes of foods & developing score cards. Triangular tests, duo & trio tests & others.
2.	Standardisation of recipes & methods or reporting recipes.
3.	Experiments on crystallization of sugar & effects of temperature, concentration, acids and other preparation & evaluation of any three preparations. Laddoo, Halwa&GulabJamun.
4.	Experiment on starch gelatinization, viscosity, measurement of starch pastes- comparison of different sources of starch.
5.	Experiment with eggs to study the properties of coagulation foaming, emulsifying, colouring, effect of quality of eggs on these properties. Preparation of cakes, Mayonnaise evaluation.
6.	Milk cookery preparation & evaluation of soup(cream of tomato), cheese, curd, ice-cream.
7.	Meat- Methods of cooking, factors affecting texture of meat.
8.	Pulses- Method of cooking pulses, effect of soaking, alkali, salts, germination.
9	Vegetable & Fruit cooking- Factors affecting colour, texture, flavours, browning reactions & preventive methods.
10.	Fats & Oils – smoking point, absorptions, tests, shortening - effect in food preparations

Course Outcomes

After completing this course, student is expected to learn the following:

CO1:To comprehend the changes that occur in the physiochemical properties of food stuffs during food preparation.

CO2:To understand and apply the various techniques in the quality evaluation of foods.

CO3:To Impart awareness on the concept of 'food product development'

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	2	2	1	1	2	2	2	2	1	2	3
CO2	2	2	2	2	2	1	2	2	1	1	2
CO3	2	1	1	2	2	2	2	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper – XIII
Research Project
M. Sc. (Home Science) (General, Spl. Grp. 'A', 'B' & 'E') II Semester/ B.Sc.(H.Sc.) Semester VIII

CIE – 25 Marks
UE – 75 Marks

Credits: 4

Course Objectives:

This course aims to enhance students' critical thinking abilities by challenging them to evaluate existing knowledge, identify gaps in understanding, and propose innovative solutions to research problems. Students are encouraged to think analytically and creatively throughout the research process.

Course Content:

1. Review of Literature and methodology of the study
2. Finalization of Data collection tool

Abbreviations:

CIE: Continuous Internal Evaluation **UE:** University Exam

Course outcomes:

After completing this course, student is expected to learn the following:

CO1: Demonstrate advanced critical research skills, to establish links between theory and methods within their field of study

CO2: Acquire research skills to develop a research proposal, understand protocol, design and manage a piece of original project work

CO3: Help to develop in-depth knowledge of the major subject/field of study, including deeper insight into current research

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	2	2	1	1	3	2	2	2	1	2	3
CO2	2	2	1	2	3	1	2	2	1	1	3
CO3	2	3	1	2	3	2	2	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper -XIV

Techniques and Instrumentation in Nutrition Research: Nutritional Biochemistry -III
MSc. (Home Science) Specialisation Group 'B' III Semester/ Semester-IX

Course Type: Theory Major
Credits: 4
Teaching Periods: 4/ week

CIE – 25 Marks
UE – 75 Marks

Course Objectives:

This course aims to equip students with the knowledge, technical proficiency, and critical thinking skills necessary to conduct advanced research in the interdisciplinary field of nutritional biochemistry, contributing to advancements in understanding the role of nutrients in human health and disease.

Unit I:	**Periods**
• **Radioactive** and heavy isotopes, their characteristics, detection, measurement and application in nutrition research.	3
• **Immunological Methods**: Principle and brief description of Radio immune assay (RIA) and Enzyme linked immune sorbent assay (ELISA).	3
Unit II:	
• **Chromatography**- Principles and application in paper (Circular, ascending and descending), ion exchange, column, thin layer, gas liquid and high performance, liquid chromatographic techniques.	3
• **Electrophoresis**- Principles and application in paper and gel electrophoresis	3
• **Automation**- Clinical biochemistry: Principle and application of auto analyser	3
Unit III:	
• Principle,brief description and application of Nuclear magnetic resonance (NMR) and Dual energy x-ray absorptiometry (DEXA).	3
• Overview of principles and applications of microbiological assays.	4
• **Assessment of Nutritional status**- Anthropometry (Anthropometric indices, cut offs, classification of nutritional status, growth standards), Clinical assessment and body composition, Dietary assessment (Family diet survey, diet recall, food balance sheet), Biochemical assessment (PEM, Vitamin A deficiency, Anaemia, Iodine deficiency, Vitamin D deficiency).	5
Unit IV:	
• **Methods in animal experimentation**- Selection of animals, importance of limiting the extraneous stress to experimental animals, preparation of diets for lab animals (natural, purified and chemically defined diets), feeding lab animals (ad-libitum, pair feeding, restricted feeding), taking samples from Animals(blood sampling, anaesthesia, euthanasia),	3

ethical norms of animal experimentation.	
• **Human intervention trials on Nutrition experimentation**: Details and ethical norms.	2

Sessional work:

1. Estimation of total, free and conjugated bilirubin in blood serum.
2. Estimation of total and lipoprotein cholesterol in blood serum. Assay of alkaline phosphatase activity in serum.
3. Assay of activity of transaminases (SGOT, SGPT) in serum.
4. Standardisation of colorimetric and spectrophotometric method.
5. To study the working of an atomic absorptiometer.
6. Separation of the various components of a mixture using chromatographic method.
7. Assessment of nutritional status-
    - Anthropometric tools and measurement of height, weight, MUAC and skin fold thickness.
    - Diet survey and diet calculations

Reference:

1. Sharma S(1993). Practical Biochemistry. Classic Publishers, Jaipur(India)
2. Raghuramulu et al(1983). A manual of laboratory techniques. National Institute of Nutrition, Hyderabad (India).
3. Oser BC (1965) 14th ed. Hawk's physiological chemistry. Tata Mc graw Hill publishing co ltd.
4. Sharma B.K(1999) 8th ed. Instrumental methods of chemical analysis, Get publishing house.
5. Sharma S (2007). Experiments and Techniques in Biochemistry. Galgotia Publication Pvt Ltd.
6. AOAC Official Methods of Analysis- Volume 1(19th Edition)-2012,AOAC International.

Course Outcomes

After completing this course, student is expected to learn the following:

CO1:To understand the principles of various analytical techniques available for nutrition research.

CO2:To become efficient in the use of some of the most commonly used techniques and instruments in High quality research.

CO3:To understand the principles and use of instruments used for protein, DNA and radioactive isotopes.

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	2	2	2	1	3	2	1	2	1	2	3
CO2	2	2	2	1	2	1	2	1	1	1	2
CO3	2\	1	2	1	1	2	1	1	1	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper- XV
Institutional Food Management
MSc. Food and Nutrition SPL. Group 'B'
MSc. GENERAL III Semester/
Semester-IX

Course Type: Theory Major
Credits: 4
Teaching Periods: 4/ week

CIE – 25 Marks
UE – 75 Marks

Course Objectives

This course aims to prepare students for careers in food service management by equipping them with the knowledge, skills, and practical experience needed to effectively oversee food service operations, deliver high-quality meals, and meet the diverse needs of institutional clientele while adhering to industry standards and regulations

CONTENTS

UNIT-I	**FOOD SERVICE MANAGEMENT & ORGANIZATION**	**PERIODS**
	1. Definition, principles and functions	2
	2. Types of catering establishments (Conventional, commissary, ready prepared, assembly / serve)	1
	3. Management Theories (Classical, scientific, behavioural systems approach, contingency approach, MBO, JIT , TQM)	2
	4. Managerial operations - Functions of Manager - Principles of Management - Definition of organisation& steps in organising	 1 2 1
	5. Tools of Management - Tangible Tools- organisation chart, job description, job specification, job analysis: pathway chart, process chart, work schedule, production schedule, staff and service analysis, budget. - Intangible tools – Communication, Leadership, decision making	2 1
UNIT-II	**MATERIAL MANAGEMENT**	
	1. Menu planning : Functions, factors affecting menu planning, menu construction, types of menu, menu card, Characteristics of cuisines- Indian, Chinese, Continental, French, Thai and Mexican	2
	2. Purchase: Market, buyer, vendor, methods of purchase: Formal and informal purchasing procedure	2
	3. Storage: Types of storage, store room requirement, appropriate temperature for storing different foods, storeroom records	2
	4. Food Production: Production planning and control: importance of planning, production forecast, estimating quantities to buy quantity preparation techniques, production schedule, product evaluation, standardization of recipes, recipe adjustments and portion control	4
	5. Food delivery and service: Centralised and decentralised, factors affecting selection, styles of service ,	2

	delivery and service equipment.	
UNIT-III	**ORGANIZATION OF SPACES, EQUIPMENT , SANITATION & SAFETY**	
	1. Kitchen spaces: Types of kitchen, designing kitchens	1
	2. Planning service areas	1
	3. Architectural considerations for a food service establishment	1
	4. Feasibility assessment in terms of layout design and costs	1
	5. Classification and selection of equipment	1
	6. Care and maintenance of equipment	1
	7. Importance of hygiene and sanitation in food service units	1
	8. Sanitation measures for food, personnel and unit hygiene, training techniques for food service personnel in sanitation.	1
	9. Safety- Causes of accidents, types, safety techniques, 3Es of safety	1
	10. Food laws/ Food bill - FPO, ISI, Agmark, PFA, New Food Bill 2006.	2
	11. Quality Standards- HACCP, ISO	1
UNIT- IV	**FINANCIAL MANAGEMENT**	
	1. Importance of Financial management in food based enterprise	1
	2. Budgets and Budgeting process	1
	3. Records: Menu, purchase, store, production, sales, personnel utilities	1
	4. Basic concepts n Business transactions: Cash memo, receipt, pay-in slip, cheques, vouchers	1
	5. Books of Account: Journal, sales, return book, purchase return book, sales book, purchase book, cash book, ledger	2
	6. Pricing and its methods, costing, concepts and controlling techniques, cost effective procedures, concept of break even point (BEP)	4
	7. Reports : Cost analysis: concept of trial balance, profit and loss account.	2

References:

1. West B.Bessie& Wood Levelle (1988). Food service in Institutions. 6Th Edition. Revised by Hargar FV, Shuggart SG &Palgne Palacio June, Macmillian Publishing Company, New York.
2. SethiMohini (2005). Institutional Food Management. New Age International Publishers.
3. Kotler Philip . Marketing Management (2001). Millennium edition. Prentice Hall of India.
4. Kinght JB &Kotschevar LH (2000). Quantity Food Production, planning & Management. 3rd Edition, John Wiley & sons.
5. Koontz Hand Dennel, C.Keiser J and Kaillo E. Controlling and Analysis of Cost in Food Service operation. Wiley &Sons . New York.

	Sessional work
.	Market Survey: To assess products and commodities in the market , to formulate price list, to list and categorise food production and service equipments
.	Planning Menus (for any 3) - Institutions that cater to children - Food service units in hostels - Canteen - Conferences
.	Standardising recipes for 6,25 and 50 portions Any two of the following: - Snacks - Cakes - Cereal preparation

	- Curry preparation
.	anteen project
.	roduct development: - Healthy food - Party food
.	egional/ International cuisine reparation of recipes from Regional,Chinese, Continental and American cuisines
.	ost Analysis of Menus
.	isit to different types of Food service Institutions to study the following: - Organization - Physical plan and layout - Food service equipment - Sanitation and hygiene

Course Outcomes:

After completing this course, student is expected to learn the following:

CO1:To develop a knowledge base about the different types of food service units and its evolution.
CO2:To impart necessary expertise to function as a food service manager.
CO3:To provide practical experience in managing food material for food service management.

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	2	1	2	2	1	2	2	3	2
CO2	2	2	2	2	2	1	3	2	1	1	2
CO3	3	2	2	2	2	2	2	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper- XVI
Advanced Nutrition
MSc. Food and Nutrition Spl. GROUP 'B' III Semester/ Semester-IX

Course Type: Theory Major CIE – 25 Marks

UE – 75 Marks

Credits: 4
Teaching Periods: 4/ week

Course Objectives:

The course aims to provide students with the knowledge, skills, and analytical abilities needed to critically evaluate nutrition research, apply evidence-based nutrition principles in diverse settings, and contribute to the promotion of health and well-being through optimal nutrition practices.

CONTENTS

UNIT- I	**Human Nutrient Requirements – Macro & Micronutrients**	**Periods**
	1.Historical perspectives of Nutrient requirements	2
	2. Methods of assessment of nutrient needs- a critical review	2
	3.Critical evaluation of sensitive methods and derivations of requirements and recommended dietary allowances of macro & micronutrients for all age groups:- - Energy - Carbohydrates & Dietary fiber -Proteins & amino acids - Lipids - Water - Vitamins - Minerals & trace elements	8
UNIT - II	**Nutrition in Emergency & Special Conditions**	
	1.Famine, draught, floods, earthquakes, cyclones, war , civil and political emergencies and its impact on nutrition- health	3
	2.Major deficiency diseases in emergencies and natural calamities, PEM and other nutritional deficiencies	1
	3. Assessment & surveillance of nutritional status in emergency affected populations.	1
	4. Communicable diseases- control & treatment in emergency, role of immunization and sanitation	2
	5. Disaster management cell functions and convergence	1
	6. Extreme temperatures- low & high	1
	7. High altitude	1
	8. Space Nutrition- Physiological changes in space travel, packaging for space travel, nutritional considerations	2
UNIT-III	**Epidemiology, immunity & infection**	
	1.Definition, aims, basic measurements and applications	2
	2. Study designs- methods applied in conducting nutrition research	2
	3.Measuring exposure (diet) outcome (disease) relationship and their interpretation	2
	4. Host defense mechanisms and nutrients essential in the development of immune system	2
	5. Effect of infections on the nutritional status of an individual	2
	6.Nutrient deficiencies and excesses affecting the immune-competence and susceptibility to infections	2
UNIT-IV	**Improving Nutritional Quality of Diets**	

	1. Assessment of protein quality	3
	2. Dietary diversification	2
	3. Bioavailability of Nutrients	2
	4. Nutrient losses during cooking and processing	3
	5. Nutrigenomics, nutraceuticals and bioactive compounds	2

Sessional Work

1. Seminar presentation on any topic from syllabus.
2. Academic assessment through short and long questions.
3. Discussions on any specific topic from entire syllabus.

References:

- Bamji M.S., Rao N.P., Reddy V. Eds (2009). Textbook of Human Nutrition. 3rd Edition. Oxford and IBH Publishing Co.Pvt. Ltd.
- ICMR (2010). Nutrient requirements and recommended dietary allowances for Indians.
- FAO/WHO (2004). Vitamin and mineral requirements in Human Nutrition. Report of a joint expert consultation group.
- Goyet, Fish. V. Seaman, J. and Geijer, U. (1978). The management of Nutritional emergencies in Large populations, World Health Organization, Geneva.
- WFP/ UNHCR (1998). Guidelines for selective feeding programmes in Emergency situations. Rome and Geneva: WEP/UNHCR
- Bonita R, BeagleholeR,Kjellstrom (2006). Basic epidemiology. Second edition. WHO
- Frank G.C. (2008). Community Nutrition- Applying epidemiology to contemporary practice. Second edition. Jones and Bartlett publishers.
- Park, K. (2009). Parks textbook of preventive and social medicine, 20th Edition, Jabalpur.M/S Banarsidas

Course Outcomes

After completing this course, student is expected to learn the following:

:

CO1:To understand the historical perspectives of nutrient requirements.
CO2:To critically evaluate the methodology and derivation of requirements for specific macronutrients.
CO3:To learn the importance of nutrition in emergency conditions.

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	2	2	1	1	2	2	2	1	1	2	3
CO2	2	2	2	2	3	3	2	2	1	1	2
CO3	3	2	1	1	2	2	2	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper- XVII
Food Microbiology and Food Safety
MSc. (Home Science) (General & Spl. Grp 'B') III Semester
Semester-IX

Course Type: Theory Major

CIE – 25 Marks
UE – 75 Marks

Teaching Periods: 4/Week
Credits: 4

Course Objectives

This course will enable the students:

- To understand the basis of microbial growth in various foodstuffs and its beneficial and harmful effects.
- To learn the ways and means to prevent microbial contamination during and after food processing to contain spoilage and poisoning.
- To understand the role of microorganisms in food product development.

CONTENTS

UNIT –I	**INTRODUCTION TO MICROBIOLGY**	**PERIODS**
	1. Definition, scope of Food Microbiology	2
	2. An Introduction to microbial world: Bacteria, Fungi , Yeast, Viruses. - Bacterial groups based on their morphology: Gram positive , gram negative, motile/ non-motile bacteria, sporulating/ non sporulating bacteria. - Bacterial groups based on their physiological growth factors: Temperature, pH, water activity, availability of oxygen. Intrinsic and extrinsic parameters that affect microbial growth and their relevance to food spoilage and preservation.	5
	3. Fungi and Yeast : General features and their importance in food microbiology	3
	4. Viruses and Bacteriophages: Definition, their general characteristics and multiplication	2
UNIT-II	**FOOD SPOILAGE AND DESTRUCTION OF MICROBES**	
	1. Food Spoilage :Definition, microorganisms involved in spoilage of various foods: Milk, bread, canned food, vegetables and fruits, fruit juices, meat, eggs and fish.	6
	2. Physical and chemical means used in destruction of microbes: Definition of sterilisation and disinfection. Role of heat, filtration and radiation in sterilization, use of chemical agents- alchohol halogens and detergents.	6
UNIT-III	**CONTAMINATION- INTOXICATION & INFECTION**	

	1. Sources of food contamination, food poisoning Symptoms &control . - Food Borne Intoxication: Botulism and Staphylococcal intoxication - Food borne infections- Salmonellosis, Clostridium perfrigens, bacillus cereus gastroenteritis	4 4
UNIT- IV	**MICRORGANISMS IN FOOD**	
	1. Microorganisms in food enzyme and technology: - Food Fermentation - Enzymes and food production - Microorganisms as food - Probiotics and Single cell proteins	2 2 2 2
	2. HACCP system and food safety used in controlling microbiological hazards	2

References:

1. Text Book of Zoology P.S Dhami, Pardeep Publication.
2. Food Microbiology Frazier, willian C and West off Dannis C, Tata McGraw Will Publish Company Ltd.
3. Pelczar, M.L. and Reid, R.D. Microbiology. Mc Graw Hill Book Company, New York.
4. Jay, J.M: Food Microbiology; 6th Edition, Aspen publishers, Inc.,Maryland.
5. Adams, M.R. and Moss M.G: Food Microbiology, 1ST Edition, New age International (P) Ltd.

	SESSIONAL WORK
.	Identification of microbes
.	reparation of chart and models (same as theory)
.	dentification of slides of microbes.
.	terilization
.	echniques of culturing from liquid and solid media
.	Staining of bacteria: Gram staining and spore staining
.	etermination of plate count
.	acteriological analysis of water and milk

Course Outcomes

After completing this course, student is expected to learn the following:

CO1: Learn the concepts of microbial growth in various foodstuffs.
CO2: Understand the microbial contamination during and after food processing.

CO3: Able to explain the microorganisms in food product development.

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	3	2	2	2	2	1	2	2	1
CO2	2	2	3	2	3	2	2	2	1	1	2
CO3	2	2	3	2	2	2	2	2	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Abbreviations:

CIE: Continuous Internal Evaluation **UE:** University Exam

Paper- XVIII
Computer Application in Designing
MSc. Food and Nutrition Spl. Group 'B' / Group A/ Group E
M.Sc. General III Semester
Semester- IX

Course Type: Practical Major
Credits: 4
Teaching Periods: 4/ week CIE – 25 Marks
UE – 75 Marks

Course Objectives:

- The Course aims to equip students with the knowledge, skills, and practical experience needed to create innovative and visually compelling designs using digital tools, prepare them for careers in various design fields, and adapt to the evolving demands of the design industry

Practical:

S.No.	Topics	No. of Classes
1.	Use of computer peripherals Scanner Printer Storage device	 2 2 2
2.	Use of designing softwares Power point Coral draw Photo Shop Page Maker	 3 7 4 4
3.	Planning and preparationo of communication material for rural women related to agriculture/ home science Slides Leaflet/Folder Booklet/flip Book Cover page of different publications	 4 4 6 2
4.	Field testing of developed communication material	2
5.	Evaluation of the developed material	2
	Total	**44**

References:

List of books related Computer Designing, Coral draw, photo shop and Page maker

1. Computer Graphics and Virtual Reality 2ed Willey Publication by R. K Mourya

2. Photoshop CS6 in Simple Steps by Congent Learning Solution Incorporation

3. Graphic Design Exercise Book - Revised Edition **Author:** Jessica Glaser

4. PageMaker 7 from A to Z**Author:** Marc Campbell Publisher Laxmi Publications

5. CorelDRAW X6 The Official Guide Paperback – by Gary David Bouton

.Course Outcomes:

This course will enable the students:

CO1:To enable students to learn /acquaint the CAD based application.
CO2:To understand the work of computers while designing.
CO3:To develop creativity in designing A.V.Aids.

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	1	1	1	1	2	2	2	2	1	2	1
CO2	2	2	2	2	2	1	2	2	1	1	2
CO3	2	1	1	2	2	2	2	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper – XIX
Research Project
M. Sc. (Home Science) III Semester
(General, Spl. Grp. 'A', 'B' &'E')
Semester IX

CIE – 25 Marks
UE – 75 Marks

Credits: 4

Course Objectives:

This course aims to evaluate the research project, ensuring that it aligns with the overarching goals of the subject area and meets the researcher's aims and aspirations.

Course Content:

1. Data collection for the Study
2. Interpretation of the data

Course outcomes:

CO1:Demonstrate advanced critical research skills, to establish links between theory and methods within their field of study

CO2:Acquire research skills to develop a research proposal, understand protocol, design and manage a piece of original project work

C03:Help to develop in-depth knowledge of the major subject/field of study, including deeper insight into current research

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	2	2	1	1	3	2	2	2	1	2	3
CO2	2	2	1	2	3	1	2	2	1	1	3
CO3	2	3	1	2	3	2	2	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

PAPER - XX
Advanced Physiology
MSc (Home Science)
(Spl. Grp. 'A', 'B' and General) IV Semester/ Semester X

Course Type: Theory Major

CIE – 25 Marks
UE – 75 Marks

Teaching Periods: 4/Week
Credits: 4

Course Objectives

This course will enable the students:

- To understand the functions of physiological systems including the lymphatic system, circulatory system, respiratory and digestive system, excretory and endocrine system ,reproductive and nervous system.
- To perform, analyse and report on different experiments (slides of different human organs)and observations in physiology
- To recognize and identify principal tissue structures.

CONTENTS

UNIT –I	**INTRODUCTION TO LYMPHATIC and CIRCULATORY SYSTEM**	**PERIODS**
	1. Lymphatic system and its and functions.	2
	2. Circulatory System: blood – composition, blood cells - development and function of blood cells, blood clotting, blood grouping and haemoglobin	5
	3. Heart and its anatomy. Circulation of blood, cardiac cycle, blood pressure and factors affecting blood pressure.	4
UNIT-II	**RESPIRATORY AND DIGESTIVE SYSTEM**	
	1. Respiratory system: anatomy, physiology and mechanism of respiration, regulation of respiration.	5
	2. Digestive system: anatomy of gastrointestinal tract and accessory organs. Digestion and absorption of food.	6
UNIT-III	**EXCRETORY AND ENDOCRINE SYSTEM**	
	1. Excretory system: anatomy and functions of kidney, formation, composition and excretion of urine.	5
	2. Endocrine glands, mode of action of hormones	5
UNIT- IV	**REPRODUCTIVE AND NERVOUS SYSTEM**	
	- Reproductive system: structure and functions of male and female reproductive organs.	5
	- Nervous system: anatomy and functions.	5

Reference Books:

1. Best CH and Taylor NB. 1989. The Human Body. ASI Publ. House. (Source: National Book Depot, Bombay).

2. Chatterjee CC. 1992. Human Physiology. Vols. I, II. Medical Allied Agency.
3. Guyton AC. 1991. Text Book of Medical Physiology. WB Saunders.
4. Mukherjee KL. 1994. Medical Laboratory Technology. Vol I. Tata McGraw Hill.
5. Wilson KJW and Ross JS.1987. Ross and Wilson Anatomy and Physiology in Health and Illness. 6th Ed. Churchill Livingstone.

	SESSIONAL WORK	Periods
.	Microscopic examination of prepared slides of different human organs	2
.	Estimation of haemoglobin	2
.	Identification of blood groups	2
.	Preparation of blood smear.	1
.	Measurement of blood pressure.	2
.	Estimation of blood glucose	2
.	Preparation of TEC and TLC	2
.	Preparation of blood Haem-crystals	1
.	Demonstration and study of models of human body system.	2

Course Outcomes

After completing this course, student is expected to learn the following:

CO1: Learn the concepts of circulatory system, respiratory system and digestive system
CO2: Understand the functions of physiological systems.
CO3: Able to explain the different human organs in physiology

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	3	2	2	1	1	1	2	2	1
CO2	3	2	2	2	1	2	2	2	1	1	2
CO3	2	2	1	2	2	2	2	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Abbreviations:

CIE: Continuous Internal Evaluation **UE:** University Exam

Paper-XXI
Clinical Nutrition with Compulsory Internship
MSc. Food and Nutrition Spl. Group 'B'
MSc. GENERAL IV Semester/
Semester-X

Course Type: Theory Major
Credits: 4
Teaching Periods: 4/ week

CIE – 25 Marks
UE – 75 Marks

Course Objectives:

This course aims to advance knowledge in the field of Clinical Nutrition, enhance patient care practices, and contribute to the development of evidence-based guidelines and interventions to address nutrition-related health concerns in clinical populations and Evaluate the nutritional status of individuals or populations through anthropometric measurements, biochemical analyses, dietary assessments, and clinical evaluations.

CONTENTS

UNIT-I	**NUTRITIONAL ASSESSMENT & CARE OF PATIENTS**	**PERIODS**
	1. Nutrition care process - Nutritional screening and assessment of patients- outpatient &hospitalised - Nutritional interpretation of routine medical and laboratory data - Nutrition care plan and implementation - Monitoring & follow up	 2 2 2 1
	2. Diet counselling	1
	3. Diet, Nutrition and drug interaction	2
	4. Nutrition support : Enteral & Parenteral Nutrition	2
Unit-II	**WEIGHT MANAGEMENT, DIABETES & HEART DISEASE**	
	Pathophysiology, metabolic & clinical aberrations, diagnosis , complications, treatment, MNT, dietary counselling and recent advances in – 1. Weight imbalance disorders- Overweight and Underweight 2. Diabetes Mellitus – Type 1, Type 2 & Gestational Diabetes 3. Cardiovascular disease- Hypertension, hyperlipidaemia, metabolic syndrome, myocardial infarction, congestive heart failure, coronary bypass surgery.	 3 4 5
UNIT-III	**GASTROINTESTINAL TRACT, LIVER & KIDNEY DISORDERS**	
	Pathophysiology , metabolic & clinical aberrations, diagnosis, complications, treatment, MNT, Dietary counselling and recent advances in: 1. Gastrointestinal tract disorders – GERD, Peptic ulcer, diarrhoea, lactose intolerance, celiac disease, diverticular disease, Crohn's disease and ulcerative colitis 2. Liver, Gallbladder & Pancreatic disorders- Cirrhosis, Encephalopathy, liver transplant, cholecystitis, cholecystectomy, Pancreatitis. 3. Kidney Disorders – Nephrotic syndrome, glomerulonephritis, acute renal failure,	 5 5

	chronic kidney disease, dialysis, transplant, renal stones.	5
UNIT-IV	**METABOLIC STRESS AND CANCER**	
	Metabolic & Clinical aberrations, diagnosis, complications, treatment, MNT and dietary counselling in : 1. Metabolic stress – Surgery, Burns, sepsis and trauma 2. Cancer- Role of diet in aetiology and management , effect of cancer therapy on MNT	5 4

References:

1. Lee RD & Neiman DC (2009). Nutritional Assessment. 5th Edition. Brown & Benchmark.
2. Mahan , L.K. and Escott Stump. S(2008). Krause's Food & Nutrition Therapy.12th Edition. Saunders-Elsevier.
3. Shils, M.E.., Shike ,M, Ross, A.C., Caballero B and Cousins RJ (2005). Modern Nutrition in Health & Disease. 10th .Lipincott, William and Wilkins.
4. Gibney MJ, Elia M, Ljungquist&Dowsett J. (2005).Clinical Nutrition. The Nutrition society textbook series. Blackwell publishing company.
5. Marian M. Russel M, Shikora SA. (2008). Clinical Nutrition for surgical patients. Jones and Bartlett publishers.
6. World Cancer Research fund & American Institute for Cancer Research (2007). Food, Nutrition, Physical activity and the prevention of cancer – A global perspective. Washington E.D.WCRF.

	SESSIONAL WORK
1.	Assessment of patient needs- Nutritional assessment & screening
2.	Market survey of commercial nutritional supplements - Collection of information on commercial food formula available in the market - Intravenous nutrition supplement – TPN, Cost , Composition, dosage , indications.
3.	Planning & preparation of diets using exchange lists for - Overweight & underweight - Diabetes mellitus - Peptic ulcer - Diarrhoea - Ulcerative colitis - Cirrhosis - Cholelithiasis - Hypertension - Hyperlipidaemia - Glomerulonephritis - Nephritic syndrome - Acute & chronic renal failure - Dialysis - Burns

INTERNSHIP

Duration : 3 Months
Training : Hospital Setting

Norms :
For MSc. Food & Nutrition specialization students 3 months internship in any of the following 3 hospitals :-

a) All India Institute of Medical Sciences, New Delhi.
b) Christian Medical College, Ludhiana

c) PGI, Chandigarh

For MSc. General Students, 3 month Internship in NABH Accredited hospital with Dietetics Department.

Evaluation:

1. The students will have to prepare a report and submit.
2. A presentation has to be made in seminar on their work experience.

Course Outcomes

After completing this course, student is expected to learn the following:

CO1:To learn about the nutrition care process and principles of dietary counselling

CO2:To understand causative factors and metabolic changes in various diseases/ disorders.

CO3:To understand the symptoms, diagnosis, complication and treatment in diseases

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	2	1	2	2	2	2	3	2	2
CO2	3	2	2	2	2	2	3	1	2	2	2
CO3	3	3	1	2	2	2	2	1	3	3	2

Paper-XXII
Food Processing and Preservation
MSc. Food and Nutrition Spl. Group 'B'
M.Sc General IV Semester/
Semester-X

Course Type: Theory Major
Credits: 4
Teaching Periods: 4/ week

CIE – 25 Marks
UE – 75 Marks

Course Objectives:

The course aims to equip students with the knowledge, skills, and practical experience needed to effectively manage food processing operations, ensure food safety and quality, innovate in product development, and contribute to the sustainable and responsible advancement of the food processing industry.

CONTENTS

UNIT- I	**FOOD PRESERVATION**	**PERIODS**
	1. Principles underlying food preservation operations :- i) Thermal ii) Refrigeration and freezing iii) Dehydration iv) Radiation	 2 2 1 1
	2. Use of chemical additives, ionizing radiations, pickling and curing in preservation.	4
UNIT -II	**PROCESSING TECHNOLOGY OF FOODS**	
	1. Cereals: Wheat milling process, baking technology, production of bread, barley malting. Rice processing, fractionation, parboiled rice.	4
	2. Fruits & Vegetables: Changes during ripening	2
	3. Canning process of fruits & vegetables	2
	4. Milk and Milk products: Milk processing, separation, standardization, pasteurization, homogenization, ultrahigh sterile milk.	4
	5. Meat & Fish processing : Rigor mortis, ageing, tenderizing, curing, salting, pickling.	2
UNIT-III	**FORTIFICATION AND EXTRUSION TECHNOLOGY**	
	1. Fortification Technology - Objectives - Nutritional significance -Selection of Vehicle -Fortification of salt, cereal products & dairy products	2
	2. Extruded Food: An introduction to extrusion technology	2
UNIT-IV	**PACKAGING TECHNOLOGY, FOOD LABELLING & FOOD LAWS**	
	1. An Introduction to packaging technology - Objectives - Basic packaging materials and their protective qualities - Effect of packaging on the nutritive value of foods	2
	2. FPO and other food laws governing Indian Food Industry	2

References:

- Dey S: Outlines of Dairy Technology, Oxford University Press, Delhi.
- Desrosier NW: Elements of Food Technology, Connecticut, USA: AVI publishing co.

- Mat : Cereal Technology, Connecticut, USA: AVI publishing co.
- Siddapa, GS (1986), Preservation of Fruits & Vegetables, ICAR Publication.
- National Dairy development board, Amul, Milk and Milk products processing
- Gould GW. New Methods of Food Preservation. Blacklie. Academic & Professional, London.

Sessional Work

1. Seminar presentation on any topic from syllabus.
2. Academic assessment through short and long questions.
3. Discussions on any topic from entire syllabus.

Course Outcomes

After completing this course, student is expected to learn the following:

CO1:To understand the principles and processes involved in food processing
CO2:To understand the technological innovations for various food stuffs.
CO3:To gain the knowledge of fortification and extrusion technology.

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	2	2	2	3	3	3	1	2	3
CO2	2	2	3	2	3	3	2	2	2	2	2
CO3	2	2	2	2	3	2	1	2	1	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper-XXIII
Food Preservation Techniques
MSc. Food and Nutrition Spl. Group 'B'
M.Sc General IV Semester/
Semester-X

Course Type: Practical Major
Credits: 4
Teaching Periods: 4/ week

CIE – 25 Marks
UE – 75 Marks

Course Objectives:

The course aims to equip students with the knowledge, skills, and practical experience needed to effectively manage food processing operations, ensure food safety and quality, innovate in product development, and contribute to the sustainable and responsible advancement of the food processing industry.

	Practical work
.	)ehydration of fruits and vegetables and shelf life studies: is effect on colour, texture and flavour.
	reservation of fruits and vegetables using low temperature
.	reservation of fruits and vegetables using heat, salt and sugar
.	rocessing of tomato products
.	rocessing of Jams, jellies and marmalades
.	rocessing of pickles and brines.
.	repare simple extruded foods

Course Outcomes

After completing this course, student is expected to learn the following:

CO1:To understand the principles and processes involved in food processing

CO2: To understand the technological innovations for various food stuffs.

CO3: To gain the knowledge of fortification and extrusion technology.

Course Mapping:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	**PSO 6**
CO1	**3**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**1**	**2**	**3**
CO2	**2**	**2**	**3**	**2**	**3**	**3**	**2**	**2**	**2**	**2**	**2**
CO3	**2**	**2**	**2**	**2**	**3**	**2**	**1**	**2**	**1**	**2**	**2**

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper-XXIV
Nutrition in Critical Care
MSc. Food and Nutrition Spl. GROUP 'B' IV Semester/ Semester-X

Course Type: Theory Major — CIE – 25 Marks
Credits: 4
Teaching Periods: 4/ week — UE – 75 Marks

Course Objectives:

The course aims to prepare students to provide comprehensive, evidence-based nutrition care to critically ill patients, optimize nutritional support interventions, and contribute to improved patient outcomes, quality of life, and recovery in the intensive care unit (ICU) and other critical care settings.

CONTENTS

UNIT-I	**NUTRITION FOR CRITICALLY ILL**	**PERIODS**
	1.Nutritional screening and nutritional status assessment of the critically ill	2
	2.Nutritional support systems and other life saving measures for the critically ill.	2
	3.Role of immune enhancers, conditionally essential nutrients, immune-suppressants and special diets in critical care.	2
	4.Complications of nutritional support systems including refeeding syndrome	2
	5.Rehabilitation diets- stages	2
	6.Diet related ethical issues in the terminally ill	2
UNIT-II	**ENTERAL & PARENTERAL NUTRITION**	
	1.Enteral Nutrition : Introduction, Advantages, indication, enteral feeding methods (gastric or trans-pyloric tube feeding), techniques of tube placements: complication of tube feeding, measures of monitoring EN.	6
	2.Parenteral Nutrition : Introduction, indications of parenteral nutrition, components and requirements for PN solution, delivery and monitoring for PN , complications of PN (technical, metabolic or infective)	6
UNIT- III	**SOME SPECIAL CONDITIONS**	
	1.Role of immune-enhancer, immunosuppressants and special diet in critical care.	2
	2.Diet and metabolic aspects and special nutritional requirements in ESRD and multiple organ failure	3
	3.Lung disorders- Brochopulmonary dysplasia, COPD	2
	4.Musculoskeletal and rheumatic disorder- Osteoporosis, arthritis, SLE, Multiple sclerosis	3
	5.Complementary and adjunctive therapies- Naturopathy, Ayurveda ,Phytotherapy	2
UNIT-IV	**SURGERY AND OTHER COMPLICATIONS**	
	Clinical and metabolic aspect and special nutritional requirement in following conditions: a) Stress, trauma, sepsis and burns b) C.V complications and surgery c) Kidney transplant, dialysis d) Hepatic failure and transplant e) GI tract surgery	 3 2 2 2 1

	f) Diabetic complications g) Neurosurgery	1 1

Reference's:

1. Shils,M.E., Shike M, Ross, A.C., Caballero B and Cousins RJ (2005). Modern Nutrition in Health and Disease. 10TH Ed. Lipincott., Willian and Wilkins.
2. Mahan , L.K. and Escott Stump.S. (2008). Krause'S Food & Nutrition Therapy 12th Ed. Saunders- Elsevier.
3. Gibney MJ, Elia M, Ljungquist&Dowsett J. (2005). Clinical Nutrition. The Nutrition Society of Textbook series. Blackwell Publishing company.
4. Zaloga , G.P (1994). Nutrition in critical care. Times Mirror/ Mosby.
5. Phileps , G.D and Lodgers C.L. (1986). Parenteral and Enteral Nutrition- A practical guide Churchill. Livingstone.

	SESSIONAL WORK
1.	Preparation of blenderised formulae for enteral feeding- -Standard tube feed formula. -High Calorie high protein tube feed formula - Diabetic feeds -Renal Feeds -Hepatic feeds
2.	Collection of information on commercial food formula available in the market and their evaluation
3.	Intravenous nutrition supplement (TPN)- (Cost , Composition, dosage, indications and contraindications)
4.	Dietary management in arthritis
5.	Dietary management of dialysis and kidney transplant
6.	Ayurveda Cooking
7.	Dietary management in burns
8.	Diet in different surgical conditions

Course Outcomes:

After completing this course, student is expected to learn the following:

CO1: To understand the physiology, metabolism and special nutritional requirement for critically ill.
CO2:To familiar with the special nutritional support teaching and feeding formula to meet their nutritional needs.

Course Mapping:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	**PSO 6**
CO1	**3**	**2**	**2**	**2**	**2**	**2**	**3**	**1**	**2**	**3**	**2**
CO2	**3**	**2**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Paper-XXV
Research Project
MSc. Food & Nutrition Specialization IV Semester/ Semester-X

Credits: 4

UE – 75 Marks
CIE – 25 Marks

Course Objectives:
This course aims to evaluate the research project, ensuring that it aligns with the overarching goals of the subject area and meets the researcher's aims and aspirations.

Course Content:
Report writing and finalization of Research project

Course outcomes:

After completing this course, student is expected to learn the following:

CO1: Demonstrate advanced critical research skills, to establish links between theory and methods within their field of study
CO2: Acquire research skills to develop a research proposal, understand protocol, design and manage a piece of original project work
CO3:Help to develop in-depth knowledge of the major subject/field of study, including deeper insight into current research

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	2	2	1	1	3	2	2	2	1	2	3
CO2	2	2	1	2	3	1	2	2	1	1	3
CO3	2	3	1	2	3	2	2	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

PAPER – C1

Thrust Areas of Home Science

PGDR (Home Science)

Semester XI

Course Type: Theory Major

CIE – 25 Marks
UE – 75 Marks

Teaching Periods: 6/Week
Credits: 6

Course Objectives:
This course aims to evaluate the research project, ensuring that it aligns with the overarching goals of the subject area and meets the researcher's aims and aspirations.

UNIT- I	**INTRODUCTION TO RESEARCH IN HOME SCIENCE**	**PERIODS**
	Need of research in different fields of Home Science	**6**
	Identification of thrust areas of Home Science	**6**
UNIT- II	**SIGNIFICANCE OF RESEARCH IN HOME SCIENCE**	
	Scope and Significance of Research Conducted in different areas of Home Science	**12**
UNIT- III	**SOURCES AND PRIORITY OF FUNDING AGENCIES FOR PROJECTS AND RESEARCH**	
	Understanding types of Grant and Funding	**4**
	National and international funding agencies (UGC, DST, NIPCED, UNICEF, INSA)	**4**
	Process to get funding for a research project	**4**
UNIT- IV	**RESEARCH APPLICATIONS OF HOME SCIENCE**	
	Research Applications of Home Science in formal and informal institutions	**7**
	Relevance of Home Science in Current Era	**5**

SESSIONAL WORK: Assignments related to the respective units

References:

1. Research Projects and Research proposals. A guide for Students seeking funding by Paul G. Chaplin.

Cambridge University Press.
2. Desrosier NW: Elements of Food Technology, Connecticut, USA: AVI publishing co.
3. Principles of Home Science: S.R.Sharma, Vijay Kausik; Anmol Publications PVT. LTD, New Delhi
4. Encyclopedia of Home Science: S. A Srivastava
5. Education and Communication for Development : O. P. Dahama and O.P. Bhatnagar; Oxford & IBH Publishing Co. PVT Ltd. New Delhi
6. Child Development : E. B. Hurlock
7. Human Development: F. P. Rice; Perntice Hall, New Jursey
8. Research Trends in Home Science and Extention: Prakash Singh; Akinik Publications, New Delhi
9. Teaching of Home Science, Seema Yadav; Anmol Publications PVT. LTD. New Delhi

Course Outcomes

After completing this course, student is expected to learn the following:

CO1:To understand the need and significance of Research in different areas Home Science.

CO2:To know the different funding agencies for Research Projects.

CO3:To gain the knowledge of different Research Applications in various fields of Home Science.

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	2	2	1	1	3	2	2	2	1	2	3
CO2	2	2	1	2	3	1	2	2	1	1	3
CO3	2	3	1	2	3	2	2	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Abbreviations:

CIE: Continuous Internal Evaluation **UE:** University Exam

Paper – C 2
Essentials of Entrepreneurship
PGDR (Home Science)
Semester XI

Course Type: Theory Major

CIE – 25 Marks
UE – 75 Marks

Teaching Periods: 6/Week
Credits: 6

Course Objectives:

This course aims to empower students with the knowledge, skills, and confidence to pursue entrepreneurial opportunities within the field of home science, create value for themselves and society, and contribute to economic development and social well-being.

UNIT- I	**Concept of Entrepreneurship**	**PERIODS**
	Definition, Concept of entrepreneurial development, Theory of Entrepreneurial origin, Need for Self Employment	**3**
	Economic empowerment, Gender discrimination from societal perspective, Status of women in India in the last decade	**3**
	Desired qualities in entrepreneurs	**3**
	Development of women entrepreneurs in India	**3**
UNIT- II	**Establishing a Small Scale Enterprise**	
	Environment scanning	**3**
	Enterprise selection, market assessment, enterprise feasibility study, SWOT analysis	**3**
	Resource mobilization finance technology, raw material, site and manpower	**3**
	Costing, Quality control, profitability and future growth	**3**
UNIT-III	**Operating the Small Scale Enterprise**	
	Schemes available for women entrepreneurs	**4**
	Financial management issues in SSE- definition and scope	**4**
	Marketing management issues in SSE- marketing strategies and marketing mix variables	**4**
UNIT- IV	**Project Planning**	
	Planning basic concepts, need, and feasibility	**4**

	Project identification basic goal	**4**
	Monitoring and evaluation	**4**

SESSIONAL WORK

1. Prepare case profiles of any five entrepreneurs in India.
2. Review employment trends of women in the organized and unorganized sectors.
3. Visit small enterprises and prepare report on it.
4. Prepare a project plan for any business.

References:

1. Dr. G.K. Varshney (2019), Fundamentals of Entrepreneurship, Sahitya BhawanPublication.
2. S A Kumar, S C Poornima, M K Abraham, K Jayshree (2021), Entrepreneurship Development Paperback, New Age International publishers.
3. Charantimath Poornima M.(2018), Entrepreneurship Development and Small Business Enterprises, Third Edition, Pearson Education .
4. Chandra, P. (1992) project preparation, appraisal, budgeting and implementation, Tata Mc graw Hill, New Delhi.
5. Goel, E.B. (1991) project management. Tata Mc graw Hill, New Delhi.

Course Outcomes:

After completing this course, student is expected to learn the following:

CO1:The main aims of the course are to familiarize students with various concepts used in understanding processes involved in entrepreneurship and business formation and development.

CO2:Understand theories of entrepreneurship and business development

CO3:Understand the key resources required to develop an existing business such as ideas and finance, launch a new venture, or initiate a business enterprise

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	2	2	1	1	3	2	2	2	1	2	3
CO2	2	2	1	2	3	1	2	2	1	1	3
CO3	2	3	1	2	3	2	2	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Abbreviations:

CIE: Continuous Internal Evaluation **UE:** University Exam

Paper – C3

Research Methodology

PGDR (Home Science)

Semester XI

Course Type: Theory Major

CIE – 25 Marks
UE – 75 Marks

Teaching Periods: 4/Week
Credits: 4

Course Objectives:

The primary objective is to familiarize students with the fundamental concepts, principles, and processes involved in conducting research. This includes understanding the scientific method, formulating research questions, developing hypotheses, and designing research studies. and learn about different research designs, such as experimental, quasi-experimental, correlational, and qualitative designs.Students learn about different sampling methods, such as random sampling, stratified sampling, and convenience sampling, and their applications in research..

UNITS	COURSE AND DETAIL	PERIODS
UNIT- I	**INTRODUCTION TO RESEARCH** Research Methodology, Meaning of Research, Scientific Thinking, Objectives of Research, Types of research- analytical, applied fundamental, quantitative and qualitative, Conceptual and Empirical, Significance of research, Criteria of good research, Basis of selection of the broad areas of research, selection of Institute, selection of research supervisor, Major research centers in India. Ranking Institutions (Criteria and Selection Procedure), Problems encountered by researchers in India.	**12**
UNIT- II	**IDENTIFYING THE RESEARCH PROBLEM** (a) What is research problem, Selection of the problem, Technique involved in defining a problem, Formulation of hypothesis, Meaning and need for research design, Research Designs- Exploratory, Descriptive, Experimental and Historical. Basic principles of research design, Execution of the research. (b) Sampling techniques, pilot study, Qualitative and Quantitative Data, Scaling and Measurement Techniques- Likert, Guttman and Thustone scale, testing of validity and reliability.	**7** **5**

UNIT-III	**DATA GATHERING INSTRUMENTS/ TOOLS AND ANALYSIS OF DATA THROUGH COMPUTER APPLICATIONS** Collection and analysis of data, Data Analysis by using of computer software (Excel, SPSS) - Coding, Tabulation, measures of central tendency, measures of dispersion, correlation, regression and test of significance (Z-Test, t-Test, Chi-Square test, F –test, ANOVA).	**12**
UNIT- IV	**(a) INTERPRETATION AND REPORT WRITING** Meaning of Interpretation, Necessity of interpretation, Techniques and precautions in Interpretation, Significance of report writing, Research papers and reviews, Different steps in writing report, Layout of the research report, precautions of writing research reports, developing a research proposal, Basic knowledge of organizing conferences, symposia, workshop, and exhibitions. **(a) LITERATURE SURVEY** References, Abstraction of a research paper, possible ways of getting oneself abreast of current literature, High rank Journals, Impact Factors, h – factor, Citation Index. **(b) SCIENCE AND ETHICS** Intellectual property and Intellectual property rights, Indian patent system, Research agreement, Ethical theory and applications, Ethical issues in science research and reporting the problem of plagiarism and related issues, International norms and standards.	**4** **4** **4**

SESSIONAL WORK

- Prepare a research plan of any field of Home Science.
- Prepare a Schedule/Questionnaire of the related topic using scaling techniques.
- Gathering information from pilot survey and make a sample master chart for analysis.

References:

1. Research Methodology, Methods and Techniques. C.R. Kothari, New Age International (P) Limited Publishers.
2. Research Methodology – Deepak Kumar Bhattacharya Excel Books.
3. The Ethics of Science: An Introduction. David B Resnik, Routledge Publisher, USA.
4. Ethical values for Excellence in Education and Science. J.N. Kapur. VishvaPrakashan, New Delhi.
5. OSU Safety Manual 1.01
6. Practical skills in Chemistry, JR Dean, AM Jones, D. Holmes, R. Read, J. Weyers and A. Jones.Pearson Education Ltd. (Prentice Hall).

7. The Student's Guide to Preparing Dissertations and Thesis. London: Kogan.

8. MLA Handbook for writers of research papers, East West Press, New Delhi.
9. Thesis Writing: A manual for Researchers. New Age International Ltd.

10. Write and publish a scientific paper by Robert A. Day Oryse Press.

11. Research Projects and Research proposals. A guide for Students seeking funding by Paul G. Chaplin. Cambridge University Press.
12. Write Mathematics Right: L Radhakrishnan, Narosa.
13. Satarkar, S.V. (2000), Intellectual Property Rights And Copy Right, Ess Ess Publications.

Course Outcomes:

After completing this course, student is expected to learn the following:

CO1:To understand the significance of Research Methodology in Home Science Research.
CO2:To study the types, tools and Methods of Research and develop the ability to construct data appropriate to the Research Design.
CO3:To be able to appreciate and understand importance of writing scientifically.

Abbreviations:

CIE: Continuous Internal Evaluation **UE:** University Exam

Course Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	2	2	1	1	3	2	2	2	1	2	3
CO2	2	2	1	2	3	1	2	2	1	1	3
CO3	2	3	1	2	3	2	2	1	2	2	2

Matching: * 0 to 30% = 1; *30% to 60% = 2; * 60% to 100% =3

Research Project

(Qualifying)