27th (BOS)
02/06/2026

M.Sc. (Home Science) Food & Nutrition
Curriculum
V-(56)

Department of Home Science
Swami Vivekanand Subharti University, Meerut

Session (2026-2027)

Academic Council date - 11/03/26
Executive council date - 27/06/26

2.6.2026

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DEPARTMENT OF HOME SCIENCE
S. V. Subharti University, Meerut

M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
I YEAR/ I SEM
Course Code- CC-1
Research Methodology and Academic Writing
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: First**	**Semester: I**
Course Description: This course is designed to develop foundational understanding of research methodology, research ethics, data collection and analysis, and academic writing. It enables students to carry out independent research projects, interpret findings, and present them in a scholarly manner.		
Course Code: CC-1	**Course Title:Research Methodology and Academic Writing**	
Course Objective: · To provide an understanding of the research process and its components · To familiarize students with qualitative and quantitative research methods · To develop skills in preparing research proposals, reports, and theses · To introduce techniques and formats of academic writing		
Course Outcomes: After successful completion of the course, students will be able to: · Understand the fundamentals of research design and methodologies · Formulate research problems and hypotheses · Apply appropriate data collection and analysis techniques · Write research proposals, reports, and academic articles following proper citation styles · Uphold ethical considerations in conducting and reporting research		
Credits: 3+1		**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)		**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)
Total No. of Lectures: Theory (45) +Practical (30)		

Units	**Topic**	**No. of Lectures**
I	**Introduction to Research**: Meaning, types, significance in Human Development, scientific approach, research process, formulation of research problems, objectives, hypotheses	**12**
II	**Research Design and Methods**: Types of research design (exploratory, descriptive, experimental), sampling techniques, tools and techniques of data collection (questionnaires, interviews, observation)	**11**
III	**Data Processing and Analysis**: Coding, tabulation, interpretation, introduction to statistical tools, measures of central tendency, standard deviation, correlation, testing of hypothesis	**11**

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IV	**Academic Writing and Research Ethics**: Structure of research report, referencing styles (APA, MLA, Chicago, Harvard, Vancouver), plagiarism, ethical issues in research, use of digital tools.	**11**
		45
Practical:	• Identification of research problems in Human Development/ Food and nutrition • Preparation of a sample research proposal Designing tools for data collection Conducting pilot study and presenting data • Practicing in-text citation and bibliography using referencing software • Writing academic essays and reports	**30**

Suggested Readings:

1. Kothari, C. R. (2004). *Research Methodology: Methods and Techniques*. New Age International
2. Best, J.W. & Kahn, J.V. (2014). *Research in Education*. Pearson
3. Creswell, J.W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. SAGE
4. Kumar, R. (2011). *Research Methodology: A Step-by-Step Guide for Beginners*. SAGE
5. Day, R.A. & Gastel, B. (2011). *How to Write and Publish a Scientific Paper*. Cambridge University Press
6. American Psychological Association. (2020). *Publication Manual of the APA (7th ed.)*

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
I YEAR/ I SEM
Course Code- CC-2
Advanced Nutritional Biochemistry
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: First**	**Semester: I**

Course Description: This course is designed to enhance and build upon the foundational biochemistry knowledge gained at the undergraduate level. It offers an in-depth exploration of metabolic regulation and the intricate interrelationships among key biochemical pathways. The course emphasizes the physiological mechanisms the human body employs to maintain metabolic balance, while also introducing students to advanced biochemical techniques and instrumentation. This comprehensive understanding prepares students for specialization in the field of nutrition, enabling them to interpret biochemical data and apply this knowledge to clinical and research settings.

Course Code: CC-2	**Course Title: ADVANCED NUTRITIONAL BIOCHEMISTRY**

Course Objective:

- To augment the biochemistry knowledge acquired at the undergraduate level.
- To understand the mechanisms adopted by the human body for regulation of metabolic pathways.
- To get an insight into interrelationships between various metabolic pathways.
- To understand the principles and use of Instruments used for biochemical analysis.
- To become proficient for specialization in nutrition.

Course Outcomes: Students will be able to learn:

- Demonstrate advanced understanding of biochemical principles, especially in the context of human metabolism and nutritional biochemistry.
- Explain the regulatory mechanisms of major metabolic pathways and their physiological relevance.
- Analyze the interconnectivity and integration of carbohydrate, lipid, protein, and nucleic acid metabolism.
- Apply knowledge of biochemical instrumentation (e.g., spectrophotometer, chromatography, electrophoresis) in laboratory-based analysis and research.
- Evaluate biochemical parameters and interpret results in the context of nutritional status and health.
- Develop readiness for higher-level studies and professional roles in nutrition, clinical biochemistry, or related biomedical sciences.

Credits: 3+1	**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	**Topic**	**No. of Lectures**
I	**CARBOHYDRATES, LIPIDS AND THEIR REGULATION**	**15**

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	Carbohydrates • **Structure and properties of mono saccharine, di saccharine and poly saccharine.** • Glycolysis (aerobic and anaerobic). • Gluconeogenesis • Glycogenolysis and Glycogenesis • Hexose Monophosphate Shunt/ Pentose Phosphate Pathway/Shunt • Citric acid cycle. • Electron transport chain and oxidative phosphorylation. **Proteins** • **Structure, composition, classification a functions of proteins.** • Insulin, myoglobin and hemoglobin. • Metabolism of proteins and amino acids. • Build up of amino acid pool. • Urea cycle, Creatinine and Creatine Synt **Lipids** • **Structure, composition, classification a properties of lipids.** • Fatty acids – synthesis of saturated unsaturated • Triacylglycerol – synthesis • Phospholipids – synthesis • Lipoproteins – synthesis • Cholesterol – synthesis and regulation • Beta-oxidation	
II	**HORMONES** • Endocrinology • Target cell concept. • Receptors. • Classification of hormones. • Signal transduction. • Intracellular messengers • Secondary messengers • Prostaglandins	**5**
III	**NUCLEOTIDES AND NUCLEIC ACID** **Nucleosides and Nucleotides** • Nucleosides • Nucleotides: Purine Synthesis, Pyrimidin Synthesis. **Nucleic Acids** • RNA & DNA • Central dogma—replication, translation a transcription • DNA repair systems • DNA recombinant • Genetic mutations	**10**

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	• Regulations of gene expression • Protein biosynthesis	
IV	**INSTRUMENTATION IN NUTRITIONAL BIOCHEMISTRY** (a) Basic principles of spectrophotometry. • Beer Lambert`s law. • Colorimetry.& Spectrophotometry • Atomic absorption. • Flame photometry. (b) Basic principle of following techniques. • Gel filtration. • Ion exchange chromatography. Affinity chromatography. HPLC. • Gas Chromatography	**15**
		45
Practical:	• Calcium: Estimation of calcium in food and serum • Phosphorus: Estimation of inorganic phosphorus in food and serum • Ascorbic Acid: Estimation of ascorbic acid in foods • Proteins: a) Estimation of protein in food stuffs • b) Estimation of albumin, globulin and albumin/globulin ratio in serum. • c) Estimation of hemoglobin • Glucose: Estimation of glucose in blood • Cholesterol: Estimation of Cholesterol in blood • **SDG 2: Zero Hunger:** Zero Food Waste - Collaboration with and donation of excess canteen/ hotel/ mess food through safe redistribution channels. • **SDG 2: Zero Hunger:** Recycling food and competitions to reduce food	**30**

Suggested Readings:

- BergJM, Tymoczko JL and Stryer L. (2002) Biochemistry 5th ed. W.H. Freeman.
- Devlin TM. (2002) Text Book of biochemistry with Clinical Correlations 5th ed. John Wiley and Sons.
- Horton RH, Moran LA, Ochs RS, Rawn JD and Scrimgeour.(2002) Principles of Biochemistry 3rd ed. Prentice Hall.
- Murray RK, Granner DK, Kayes PA and Rodwell V.W. (2003) Harper's Illustrated Biochemistry. 26th ed. McGraw-Hill. Asia.
- Voet D and Voet JG. (2004)Biochemistry. 3rd ed. John Wiley and Sons.
- King, E.J. and Wootton, I.D.P. (1956) 3rdEd. Micro-Analysis inMedical Biochemistry. J and A Churchill Ltd.
- Plummer, D.T.(1987). 3rded. An Introduction to Practical Biochemistry, McGraw-Hill Book

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
I YEAR/ I SEM
Course Code- CC-3
HUMAN PHYSIOLOGY
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: First**	**Semester: I**

Course Description: This course provides an in-depth exploration of advanced topics in human physiology, focusing on the complex interactions among organ systems and their relevance to nutritional science. It emphasizes the integrative functioning of physiological systems and how these are affected under normal and pathological conditions. Special attention is given to the physiological basis of nutrition and the implications of structural and functional changes in disease states. The course equips students with the foundational physiological knowledge essential for clinical application, nutrition planning, and research.

Course Code: CC-3	**Course Title: HUMAN PHYSIOLOGY**

Course Objective: This course will enable students to:

1. Advance their understanding of some of the relevant issues and topics of human physiology.
2. Enable the students to understand the integrated function of all systems and the grounding of nutritional science in physiology.
3. Understand alterations of structure and function in various organs and systems in disease conditions.

Course Outcomes: By the end of this course, students will be able to:

- Demonstrate an advanced understanding of key physiological processes relevant to human health and nutrition.
- Explain the integrated functioning of organ systems and their significance in maintaining homeostasis.
- Analyse the physiological basis of nutritional science, including digestion, absorption, metabolism, and nutrient utilization.
- Identify and describe physiological alterations in various systems under disease conditions. Apply physiological principles in understanding clinical and nutritional disorders.
- Interpret current research findings on human physiology with relevance to nutrition and disease management.

Credits: 3+1	**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	**Topic**	**No. of Lectures**
I	• Cell- structure and functions, cell size, cell shape, types of cell, cell theory, plant and animal cell, brief review of cell organelles. • Nervous system- nerve, nerve impulse.	**10**

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	neuron, synapse, CNS, Afferent and Efferent nerve, Blood-brain barrier, Hypothalamus. • Review of structure and function- Human eye and ear.	
II	• Endocrine glands and exocrine glands- structure, function, role of hormones. • Digestive system- structure and function, role of liver, pancreas and gall bladder. • Respiratory system- structure and functions, role of lungs in the exchange of gases.	**10**
III	• Circulatory system- structure and function of heart, blood pressure, composition of blood, blood groups. • Immune system- cell mediated and acquired immunity, plasma proteins.	**10**
IV	• Excretory system- structure and function of kidneys, Nephron, urine formation and composition, osmoregulation, renal failure and artificial kidney. • Muscle system- structure and function of muscles and connective tissue. • Reproduction- male and female reproduc organs, ovulation, spermatogenesis, men cycle, conception, implantation, placenta birth, concept of twins.	**15**
		45
Practical:	1.Microscope and its uses 2.Histology of epithelial, connective, muscular and nervous tissues. 3.Find out RBC and WBC count 4.Determination of pulse rate in resting condition and after exercise (30 beats/10 beats method) 5.Determination of blood pressure by Sphygmomanometer (Auscultator method). 6.Measurement of Peak Expiratory flow rate. 7.Determination of Bleeding Time (BT) and Coagulation Time (CT). 8.Detection of Blood group (Slide method). 9.Measurement of Hemoglobin level (Sahli`s or Drabkin method). **SDG 2: Zero Hunger:** Nutrition Workshops – Talk about healthy diets and malnutrition in community	**30**

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Suggested Readings:

- Ganong, W.F. (1985): Review of Medical Physiology, 12th Edition, Lange Medical Publication.
- Moran Campell E.J., Dickinson, C.J., slater, J.D., Edwards, C. R. W and Sikora, K. (1984): clin Physiology, 5th Edition, ELBS,Blackwell Scientific Publications.
- Guyton, A.C. and Hall, J.B. (1996): Text Book of Medical Physiology, 9th Edition, W.B. Scand Company, prism Books (Pvt.) Ltd., Banglore.
- Jain, A.k.; Textbook of Physiology. Vol. I and II. Avichal publishing Co., New Delhi.

M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
I YEAR/ I SEM
Course Code- CC-4
ADVANCES IN FOOD MICROBIOLOGY
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: First**	**Semester: I**

Course Description: This course offers an in-depth understanding of the role of microorganisms in food systems, encompassing both their beneficial applications in food microbiology and their detrimental impact on food safety. Students will explore the characteristics of microorganisms responsible for food spoilage, infections, and intoxications, alongside those used in fermentation and food processing industries. The course also covers the principles of food preservation and microbial control techniques, as well as the microbiological standards essential for ensuring food safety and protecting public health.

Course Code: CC-4	**Course Title: ADVANCES IN FOOD MICROBIOLOGY**

Course Objective:

- To understand the nature of microorganisms involved in food spoilage, food infections and intoxications and also those used in food biotechnology (food fermentation and various food processing industries)
- To gain knowledge of principles of various techniques used in the prevention and control of the microorganisms in foods (food preservation)
- To understand criteria for microbiological safety in various foods operations to avoid public health hazards due to food contamination.

Course Outcomes: By the end of the course, students will be able to:

- Describe the types and characteristics of microorganisms associated with food spoilage, foodborne diseases, and food fermentation.
- Explain the role of beneficial microbes in food biotechnology, including fermentation and industrial applications.
- Apply principles of microbial control and preservation techniques to improve food shelf life and safety.
- Identify contamination sources and implement practices to minimize microbial hazards in food processing and handling.
- Evaluate food microbiological safety standards and regulatory guidelines to ensure consumer health protection.
- Analyse case studies of foodborne outbreaks to understand risks, control measures, and preventive strategies in public health contexts.

Credits: 3+1	**Course Type- Core Course**
Max. Marks:	**Min. Passing Marks:**

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Semester: Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	Topic	No. of Lectures
I	**OVERVIEW OF BASIC MICROBIOLOGY** Definition, Scope of Food Microbiology An introduction to microbial world: Bacteria, Moulds/Fungi, Yeast, Viruses, protozoa Bacterial groups based on their morphology: Gram +ve/Gram –ve bacteria, Motile/Non-motile bacteria, Sporulating/Non-sporulating bacteria .Bacterial groups based on their physiological growth factors: Temperature, pH, water activity, availability of oxygen. **Fungi /Mould, Yeast:** General features & their importance in food Microbiology **Viruses and Bacteriophages:** Definition, their general characteristics & multiplication.	15
II	**FOOD SPOILAGE AND PRESERVATION** **Food Spoilage**: Definition, sources of contamination and microorganisms involved in spoilages of various foods: Milk, Bread, Canned food, Vegetables and fruits, Fruit juices, Meat, Eggs and Fish **Physical and chemical means used in destruction of microbes:** Definition of sterilization and disinfection, role of heat, filtration and radiation in sterilization, use of chemical agents-alcohol, halogens and detergents.	8
III	**MICROORGANISMS IN HUMAN WELFAI** Importance of microbes in food biotechnology: genetically engineered organisms, probiotics and single cell proteins. Traditionally Fermented foods and their health benefits with special reference to Indian Foods	7
IV	**FOOD SAFETY AND QUALITY CONTROL** Public health hazards due to microbial contamination of foods: Important food borne infections, foodpoisoning and intoxications due to bacteria, moulds, viruses (*Salmonella typhi, Helicobacter pylori, Campylobacter jejuni, Yersinia enterocolitica, Bacillus cereus, Staphylococcus aureus, Clostridium botulinum, Escherichia coli, Mycotoxins, Hepatitis A virus & Rota virus*)- Symptoms, mode of transmission and methods of prevention. Assessing the microbiological quality of food	15

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	indicator organisms, microbiological standards, principles of GMP & HACCP in food processing. Safety management at household and industrial level. BOD, COD & water quality	
		45
Practical:	• **Preparation of common Laboratory** • **media and special media** for cultivation bacteria, yeast and moulds. • **Staining of Bacteria**: Gram +ive and Gram -ive • **Cultivation and identification of** • **important culture molds and yeast** (Slides and molds culture) • **Study of environment around us as sources of transmission of microorganisms in foods.** Assessment of surface sanitation of food preparation swabs and rinse techniques. **SDG 6: Clean Water and Sanitation:** 1. Handwashing stations in schools/Anganwadis and soap distribut 2. Conduct workshops on toilet hygiene a safe water storage. **SDG 1: No Poverty:** Collect and distribute essential kits (food, clothes, hygiene) to needy families.	**30**

Suggested Readings:

1. Banwart GJ.(1987) *Basic Food Microbiology* . CBS Publishers and Distributors.
2. Frazier WC, Westoff DC. (1998)*Food Microbiology. 4th ed.* Tata McGrawHill Publishing Co.
3. Garbutt John (1997) *Essentials of Food Microbiology*. Arnold London.
4. Jay JM, Loessner DA, Martin J.(2005) *Modern Food Microbiology. 7th ed.* Springer
5. Pelczar MJ, Chan ECS, Krieg N. (1993) *Microbiology. 5th ed.* Tata McGraw-Hill Publishing Ltd.
6. Prescott LM, Harley JP, Klein DA.(2008) *Microbiology. 6th ed.* WMC Brown Publishers.

M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
I YEAR/ I SEM
Course Code- DEC-1
METHODS OF INVESTIGATION
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: First**	**Semester: I**
Course Description: This course introduces students to the fundamental principles and practical applications of analytical techniques commonly used in nutrition research. Emphasis is placed on		

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understanding the scientific basis, instrumentation, and relevance of these techniques in assessing biochemical parameters. Students will gain familiarity with both classical and modern tools used in laboratory and field-based nutritional studies, preparing them for research and professional roles in nutrition and allied health sciences.

Course Code: DEC-1	**Course Title: METHODS OF INVESTIGATION**

Course Objective: This course will enable the students to:

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

To familiarize yourself with the applications of the above techniques.

Course Outcomes: By the end of this course, students will be able to:

- Explain the scientific principles behind various analytical techniques used in nutrition research.
- Demonstrate understanding of the operation and applications of techniques such as spectrophotometry, chromatography, electrophoresis, and immunoassays.
- Select appropriate analytical methods based on the type of nutrient or compound being analysed.
- Interpret data generated from analytical procedures for the purpose of assessing food and nutritional quality.
- Evaluate the strengths and limitations of various techniques used in laboratory-based nutritional investigations.

Credits: 3+1	**Course Type- Elective Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	Topic	No. of Lectures
I	**ELECTROLYTIC DISSOCIATION** – Acids, bases, salts, buffers. **BASIS OF INSTRUMENTATION**– Physic-chemical principles and methodology – colorimeter, photometry, fluorimetry, flame photometry and atomic absorptiometry.	15
II	**CHROMATOGRAPHY** – Principles and application in paper (circular, ascending and descending), ion- exchange, column, thin layer, gas liquid and high performance liquid chromatographic techniques	10
III	**ELECTROPHORESIS** - Principles and applications in paper and gel electrophoresis.	10
IV	**BIOASSAYS** – Animal studies, Human Studies, Microbiological assays. **USE OF ISOTOPES** – Radioactive and stable isotopes. **IMMUNOLOGICAL METHODS**- ELISA	10
		45
Practical:	• Acid and Alkalis: Preparation of dilute solutions of common acids and alkalis and determining their exact normalities. • Buffers: Preparation of phosphate, carbonate, bicarbonate, boric acid, acetate, chloride and determination of	30

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	their pH by the use of indicators and pH meter. • Spectrometry: Beer Lambert law, absorption maximum, preparation of standard curve and nutrient estimations in UV and visible ranges. • Chromatography: Paper – identifications of amino acids by circular, ascending and descending methods, ion-exchange separation of amino acids. • Column- Separation of proteins. Thin layer – Identifications of amino acids. Gas- liquids- estimation of fatty acids. **SDG 1: No Poverty:** Conduct surveys to id low-income households, guide them government schemes and connect them to w schemes.	

Suggested Readings:

- Boyer,R. (2000). 3rd Ed. Modern Experimental Biochemistry. Person Education, Asia.
- Dawes, E.A. (1980) 6th Ed. Quantitative Problems in Biochemistry. Longman Group Ltd.
- Khosla, B.D., Garg, V.C. and Khosla, A. (1987). 5th Ed. Senior Practical Physical Chemist Chand & Co. New Delhi.
- Raghuramulum N.; Madhavan Nair and k. Kalyanasundaram, S. (1983). A Manual of laboratory technique. NIN.ICMR.
- Sharma, B.K. (1999). 8th Ed. Instrumental Methods of Chemical Analysis Gel Publishing House
- Varley, H.; Gowenlock, A.H. and Bell, M. (1980). 5th Ed. Practical Clinical Biochem Heinemann
  Medical Books Ltd.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
I YEAR/ ISEM
Course Code- Seminar
SEMINAR
(2 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: First**	**Semester: I**

Course Description: Course Description: This course is designed to provide students with practical exposure to current issues, interventions, innovations, and field-based applications in Human Development and Food and Nutrition. The course emphasizes experiential learning through seminar presentations, case analysis, field observations, policy reviews, community-based applications, and evidence-based discussions. Students will develop professional communication, analytical thinking, research interpretation, and presentation skills by working on applied and problem-oriented themes relevant to society and industry.

Course Code: M.Sc.HS-106	**Course Title: SEMINAR**

Course Objective:

1. To develop practical understanding of contemporary issues in Human Development and Food and Nutrition.
2. To enhance students' ability to apply theoretical knowledge in real-life situations.
3. To strengthen scientific communication and professional presentation skills.
4. To promote analytical thinking and evidence-based problem solving.
5. To encourage interdisciplinary and community-oriented learning approaches.

1. **Course Outcomes:** Students will be able to: After successful completion of the course, the students will be able to:
2. Analyze practical and community-based problems related to Human Development and Nutrition.
3. Apply research findings and theoretical concepts to real-life situations.
4. Prepare and deliver professional seminar presentations on applied themes.
5. Develop communication, teamwork, and leadership skills.
6. Critically evaluate interventions, programmes, and policies related to Home Science disciplines.

Credits: 2	**Course Type- Seminar**
Max. Marks: **Semester:** Practical (50) **Sessional:** Practical (50)	**Min. Passing Marks:** **Semester:** Practical (20) **Sessional:** Practical (20)

Total No. of Lectures: Practical 60)

Units	**Topic**	**No. of Lectures**
I	Selection of applied/community-based seminar topic	5
II	Field visit/community observation/industry interaction	10

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III	Collection and analysis of data/case material	10
IV	Preparation of seminar report, posters, and presentation	10
V	Seminar presentation using ICT and audiovisual aids	15
VI	Viva voce and submission of seminar report	10
		60
Practical:	• Child Guidance and Counselling • Nutrition Assessment and Diet Planning • Lifestyle Disorders and Preventive Nutrition • Parenting and Family Counselling • Mental Health and Stress Management • Sports Nutrition and Fitness • Community Nutrition Programmes • Women and Child Health Interventions • Inclusive Education and Special Needs • Food Safety and Hygiene Practices • Nutrition Education and Behaviour Change Communication • Digital Health and Tele-counselling • Sustainable Diets and Food Security • NGO and Community-Based Interventions • School Health and Wellness Programmes	**30**

Suggested Readings:

1. Kumar, R. (2019). *Research Methodology: A Step-by-Step Guide for Beginners*. SAGE Publications.
2. Kothari, C. R., &Garg, G. (2019). *Research Methodology: Methods and Techniques*. New Age International Publishers.
3. Gibney, M. J. (2018). *Public Health Nutrition*. Wiley-Blackwell.
4. Berk, L. E. (2018). *Child Development*. Pearson Education.
5. Whitney, E., &Rolfes, S. (2019). *Understanding Nutrition*. Cengage Learning.
6. Santrock, J. W. (2017). *Life Span Development*. McGraw-Hill Education.
7. Alley, M. (2013). *The Craft of Scientific Presentations*. Springer.
8. American Psychological Association. (2020). *Publication Manual of the American Psychological Association* (7th ed.). APA.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
I YEAR/ II SEM
Course Code- CC-5
STATISTICS AND COMPUTER APPLICATION
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: First**	**Semester: II**

Course Description: This course equips students with essential statistical techniques, concepts of measurement, and data analysis required for empirical research in Human Development. It includes computer-based applications and introduces software tools such as Excel and SPSS to facilitate data analysis.

Course Code: CC-5	**Course Title: STATISTICS AND COMPUTER APPLICATION**

Course Objective:

- To introduce the foundational concepts of statistics and their relevance in human development/Food and Nutrition research.
- To develop students' understanding of measurement, data organization, and presentation techniques.
- To equip learners with analytical skills using both parametric and non-parametric statistical tests.
- To familiarize students with statistical software such as Excel and SPSS for data handling and analysis.

Course Outcomes: After completing the course, students will be able to:

- Differentiate between qualitative and quantitative research data and apply appropriate statistical tools.
- Organize, analyze, and interpret developmental data using descriptive and inferential statistics.
- Perform statistical tests such as t-test, ANOVA, Chi-square, and correlation using SPSS.
- Create data visualizations and reports using computer-based applications like Excel and SPSS for research documentation.

Credits: 3+1	**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	**Topic**	**No. of Lectures**
I	**Introduction to Statistics** • Orientation to qualitative and quantitative analyses • Introduction to quantitative procedures • Basic principles and concepts in statistics	**6**
II	**Measurement and Computation** · Fundamentals of measurement: Quantity and quality · Scales of measurement: Nominal, ordinal, interval, ratio · Reliability, validity, and standardisation of measurement	**6**

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III	**Probability and Normal Distribution** · Basics of probability · Characteristics of distributions: Skewness, kurtosis · Hypothesis testing, significance levels · Type I and Type II errors · Sampling theory and methods · Z-scores and applications	**7**
IV	**Parametric and Non-Parametric Tests** · Z-test, F-test, t-test, ANOVA and post hoc tests · Pearson's correlation (r) · Mann-Whitney U test, Sign test, Kruskal-Wallis test · Spearman's correlation · Chi-square test (2x2 and rxc tables)	**7**
V	**Computer Applications in Statistics** · Use of MS Excel in basic data analysis · Introduction to SPSS for data entry, coding, and analysis	**3**
		45
Practical:	• Introduction to MS Excel: Data entry, basic formulas, and statistical functions • Introduction to SPSS: Creating data files, defining variables, and entering data • Descriptive Statistics using SPSS: Mean, Median, Mode, Standard Deviation, Percentiles • Graphical Representation of Data: Charts and graphs using Excel and SPSS • Conducting t-tests, ANOVA, and Chi-square tests using SPSS • Correlation and Regression Analysis using SPSS • Coding of data and creation of frequency distributions	**30**

Suggested Readings:

1. Bernard, H.R. (2000). *Social Research Methods: Qualitative and Quantitative Approaches.* Thousand Oaks, Ca: Sage.
2. Gupta, S.P.: Statistical Methods, Sultan Chand and Company, New Delhi.
3. Elhane,D.N.: Fundamentals of Statistics, KitabMahal, Allahbad.
4. Simpson and Kafka: Basic Statistics, Oxford and IBH Publishers.
5. Goon, Gupta and Das: Fundamentals of Statistics Vol. I and II.
6. Snedecor and Cochran: Statistical Methods, Oxford and IBH Publishers.
7. Shukla,M.C. and Gulshan S.S.: Statistics Theory and Practice, Sultan Chand and Company, New Delhi.
8. Gupta, S.C. and Kapoor V.K.: Fundamental of Mathematical Statistics, Sultan Chand and Company, New Delhi.

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DEPARTMENT OF HOME SCIENCE
S. V. Subharti University, Meerut

M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
I YEAR/ II SEM
Course Code- CC-6
ADVANCE NUTRITION
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: First**	**Semester: II**

Course Description: This course offers an advanced exploration of evolving concepts in human nutrition. It provides a critical understanding of the historical development and scientific basis of nutrient requirements, especially macronutrients. The course emphasizes the interaction between nutrition and immune function, highlights strategies to enhance the nutritional quality of diets, and introduces students to recent research trends and emerging topics in the field. Through critical evaluation of evidence and contemporary literature, students will be equipped to engage with complex nutritional challenges and innovations in health and disease contexts.

Course Code: CC-6	**Course Title: ADVANCE NUTRITION**

Course Objective:

- To understand the historical perspective of nutrient requirements. To learn to critically evaluate the methodology and derivation of requirements for specific macronutrients.
- To appreciate the importance of nutrition immunity interactions and their implications.
- To learn various measures for enhancing nutritional quality of diets.
- To stay updated with emerging concepts in nutrition.

Course Outcomes: By the end of this course, students will be able to:

- Explain the historical evolution and scientific rationale behind current nutrient requirement guidelines, particularly for macronutrients.
- Critically evaluate methodologies used in determining nutrient requirements across different population groups.
- Describe the interactions between nutrition and immune function, and their implications for health and disease prevention.
- Identify and recommend effective measures to improve the nutritional quality of individual and community diets.
- Analyse and interpret emerging research and contemporary developments in the field of nutrition.
- Apply updated nutritional knowledge to real-world scenarios in clinical, research, and public health nutrition settings.

Credits: 3+1	**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	**Topic**	**No. of Lectures**
I	**HUMAN NUTRIENT REQUIREMENTS – MACRONUTRIENTS** Methods of assessment of nutrient needs – a critical review Critical evaluation of sensitive methods and derivations of requirements and recommended dietary allowances of macronutrients for all age groups:	**7**

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	○ Energy ○ Carbohydrates and dietary fiber ○ Proteins and amino acids ○ Lipids ○ Water ○ Critical evaluation of national international nutrient allowances; factors affecting the requirements.	
II	**INTERACTIONS OF NUTRITION, IMMUNITY AND INFECTION** ○ Host defense mechanisms and nutrients essential in the development of immune system. ○ Effect of Infections on the nutritional status of an individual. ○ Nutrient deficiencies and excesses affecting the immuno-competence susceptibility to infections. ○ Operational implications.	**8**
III	**IMPROVING NUTRITIONAL QUALITY OF DIETS** Ways of enhancing nutritional quality of diets. ○ Assessment of protein quality. ○ Dietary diversification. ○ Bioavailability of nutrients. ○ Nutrient losses during cooking and processing.	**10**
IV	**EMERGING CONCEPTS IN HUMAN NUTRITION** ○ Ongoing nutrition transition and its implications. ○ Changing trends in lifestyle patterns in population groups and their implications. ○ Nutrigenomics, Nutraceuticals, bioactive compounds.	**10**
V	**Nutrition management in special conditions:** ○ Space travel, high altitudes, low tempe and submarines.	**10**
		45
Practical:	1. Assessment of micronutrient status: Iron Ash content of food product Vitamin C 2. Assessment of macronutrients: Moisture content of food product Nitrogen Fats Carbohydrate: difference method Fiber 3. Product development by using Ingredients rich in macronutrients an micronutrients an Conduct a awarene program on it.	**30**

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	SDG 2: Zero Hunger: Zero Food Waste - Collaboration with and donation of excess canteen/ hotel/ mess food through safe Redistribution channels.	

Suggested Readings:

1. Annual Reviews of Nutrition. Annual Review Inc, California, USA.
2. Shils, M.E.; Olson, J.; Shike, M. and Roos, C. (1998): Modern Nutrition in Health and Disease. edition. Williams and Williams. A Beverly Co. London.
3. Bodwell, C.E. and Erdman, J.W. (1988) Nutrient Interactions. Marcel dekkerInc.NewYork
4. World Reviews of Nutrition and Dietetics.
5. WHO Technical Reports Series.
6. Indian Council of Medical Research. Recommended Dietary Intakesfor Indians- Latest Recommendations.
7. Indian Council of Medical Research. Nutritive Value of Indian Foods- Latest Publications.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
I YEAR/ II SEM
Course Code- CC-7
FOOD SCIENCE
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: First**	**Semester: II**
Course Description: This course provides foundational knowledge of the composition and characteristics of various foodstuffs, including cereals, pulses, fruits, vegetables, dairy, meat, and fats. It explores the physical, chemical, and sensory changes that occur in foods during processing and cooking. Emphasis is placed on applying theoretical concepts to practical food preparation and understanding how processing influences nutritional value, safety, and sensory properties. This course bridges the gap between food science theory and its practical applications in everyday meal planning and product development.		
Course Code: CC-7	**Course Title: FOOD SCIENCE**	
Course Objective: This course is designed to: • Provide an understanding of composition of various food stuffs • Familiarize students with changes occurring in various foodstuffs as result of processing and cooking • Enable students to use theoretical knowledge in various applications and food preparations.		
Course Outcomes: By the end of this course, students will be able to: • Describe the composition and functional properties of different food groups such as carbohydrates, proteins, fats, vitamins, and minerals in various foodstuffs. • Explain the physical, chemical, and nutritional changes that occur in food during processing and cooking. • Apply theoretical knowledge of food science in planning and preparing nutritious and safe food products. • Assess the impact of different cooking methods on food quality, taste, texture, and nutrient retention. • Develop basic skills in evaluating food acceptability and understanding quality parameters in food preparation. • Integrate scientific principles in modifying or enhancing recipes for health, safety, and sensory appeal.		
Credits: 3+1		**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)		**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)
Total No. of Lectures: Theory (45) +Practical (30)		

Units	**Topic**	**No. of Lectures**
I	**FOOD CHEMISTRY** **Water:** Definition of water in foods, structure, water activity, phase diagram of water, phase transition of food containing water, relation between water activity, temperature and WLF equation, interaction of water solute and food compounds, water activity and its influence on quality and	**10**

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	stability of foods, methods for stabilization of food systems by control of water activity, sorption isotherm, colloidal properties of foods. **pH**: Hydrogen ion concentration in food, oxidation reduction potential of foods and their applications in food systems.	
II	**Protein and Enzymes**: Iso-electric points of proteins, proteins as enzymes in food system, its nature, stability and action, proteolysis, application of enzymes and immobilized enzymes. **Sugars:** Composition and properties of different types of sugars, their application in food systems, crystallization, caramelization, Maillard reaction and its industrial application. **Lipids:** Properties of fats, functional properties of fats and oils, fat stabilizers, fat deterioration and antioxidants, interesterification of fats.	**10**
III	**BASIC CONCEPTS OF NEW PRODUCT DEVELOPMENT** Market research, consumer dynamics, process of product development and standardization, sensory evaluation, packaging, labelling and marketing of new food products.	**10**
IV	**FOOD SAFETY LAWS AND STANDARDS** Hazard Analysis and Critical Control Points (HACCP), Good Manufacturing Practices (GMP), Good Hygienic Practices (GHP), International Organisation for Standardization (ISO), Essential Commodities Act, Codex Alimentarius, World Trade Organisation (WTO), Technical Barrier to Trades (TBT), Sanitary Phyto-Sanitary (SPS) rules, Bureau of Indian Standards (BIS), AGMARK, Food Safety and Standards Act, 2006 (FSSA): Prevention of Food Adulteration Act (PFA), Milk and Milk Products Order (MM Meat Food Products Order (MFPO), Fruits Prod Order (FPO).	**15**
		45
Practical:	1. Effect of solutes on boiling point and freezing point of water. 2. Effects of types of water on characteristics of cooked vegetables, pulses and cereals. 3. **Sugar and jaggery Cookery:** Relative sweetness, solubility and sizes of sugars, stages	**30**

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	cookery, caramelizaation, crystallization, factors affecting crystal formation. 4. **Starches, vegetables gums and cereals**: Dextrinization, gelatinization, retrogration, thickening power, factors affecting gels. Gluten formation and factor affecting gluten formation 5. **Jams and jellies:** Pectin content of fruits, role of acid, pectin sugar in jam and jelly formation. Use of gums as emulsifier/stabilizers. 6. **Fats and oils:** Flash point, melting point and smoking point. Role of fats and oils in cookery as: shortening agents, frying medium. Factors affecting fat absorption. Fat crystals. Plasticity of fats. Permanent and permanent emulsions. 7. **Milk and milk products:** Scalding, denaturation, Effects of acid, salt, alkali, sugar, heat, enzymes, polyphenols on milk. Khoa, paneer, cheese (ripened and unripened). 8. **Egg: Structure, assessing egg quality. Use of egg cookery and effect of heat.** 9. **Pulses:** Effect of various cooking processing methods on various characterstics, 10. **Meat and poultry:** Methods affecting tenderness of meat, effect of various methods of cooking and ingredients on color, volume, texture, flavor, aroma and water holding capacity 11. **Fruits and vegetables:** Pigments: Effects of cooking, metals ions, pH, Effect of various cooking processes on different characteristics of vegetables. 12. **Leavened Products**: Fermentation-Use of micro-organism (lactic acid, yeast). 13. **Beverages:** Factors affecting quality of beverages. SDG 2: Zero Hunger: Recycling food competitions to reduce food waste.	

Suggested Readings:

1. Bureau of Indian standards: Specifications and standard methods. Volume I to XII.
2. Fellows P J (2002), Food Processing Technology- Principles and Practices, 2nd Edition. Woodhead Publishing Ltd.

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3. Food and Agriculture Organization. (1980)
Manual of Food Quality Control. Additive Contaminants Techniques. Rome.
4. Fuller, G.W. (1999) New Food Product Development. From concept to market place. CRC press, New York.
5. Graf E and Saguy I S, (1991) Principles and practices for the safe processing of foods. Butterw Heinemann Ltd., Oxford.
6. Mahindru, S N (2000) Food Additives- Characteristics Detection and Estimation. Tata McGraw Hill Publishing Co. Ltd.

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DEPARTMENT OF HOME SCIENCE
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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
I YEAR/ II SEM
Course Code- CC-8
NUTRITION FOR HEALTH & FITNESS
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: First**	**Semester: II**

Course Description: This course provides an in-depth understanding of the interrelationship between nutrition, health, and physical fitness. Students will explore the components of health and fitness and how nutrition plays a crucial role in achieving and maintaining overall well-being. The course emphasizes the development of practical skills to assess fitness levels, make informed dietary and physical activity recommendations, and adopt a holistic approach to healthy living. It combines theoretical knowledge with application-based learning to promote personal and professional growth in the field of health sciences.

Course Code: CC-8	**Course Title: NUTRITION FOR HEALTH & FITNESS**

Course Objective: This course will prepare the students to:

- Understand the components of Health and fitness and the role of nutrition in these.
- Make nutritional, dietary and physical activity recommendations to achieve fitness and well-being.
- Develop ability to evaluate fitness and well-being.

Course Outcomes: On successful completion of this course, students will be able to:

1. Understand and explain the components of health and physical fitness and their significance in everyday life.
2. Analyze and apply the principles of nutrition in promoting health, fitness, and overall well-being.
3. Formulate appropriate nutritional and physical activity recommendations for individuals with varying health and fitness needs.
4. Evaluate and assess fitness and wellness levels using scientific methods and tools.
5. Demonstrate awareness of current trends and challenges in health, fitness, and nutritional science.

Credits: 3+1	**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	Topic	No. of Lectures
I	**HEALTH AND WELLNESS** Definition, Factors affecting Health and Wellness. Physiological, psychological and socia health	2
II	**BASIC OF FITNESS** - Basic Nutrition: Relation between foods and nutrition - Nutrients: Macro nutrients-their functions, sources, digestion, absorption, Deficiency symptoms and toxicity. Micro nutrients: functions, food sources, deficiency and toxic - Non nutrient components: their association to health. - Fluid balance, Water compartments in	7

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	human body, fluid regulation water intake in different conditions, dehydration and intoxication. Recommended dietary allowances and balanced diet.	
III	**NUTRITIONAL STATUS** - Nutritional status: Definition, methods to assess nutritional status- (Relevant to maintenance of fitness), Specific fitness and health status.	**11**
IV	**MANAGEMENT OF FITNESS** - Approaches to the management of fitness and health; - Diet and exercise: Effect of specific nutrients on work performance and physical fitness. - Fuel and other nutrients that support physical activity (metabolic pathways) Mobilization of fuel stores during exercise. - Importance of carbohydrate loads. - Nutrition, exercise, physical fitness and health- their inter relationship	**10**
V	**SPORTS, YOGA AND HEALTH** - Nutrition in sports: Sports specific requirements, diet manipulation pre game and post game meals, - Use of different nutragenic aids and commercial supplements. Sports drinks. Diets for persons with high energy requirements stress, fracture injury.Significance of physical fitness nutrition in prevention and management of weight control regimes. - Nutrition guidelines for maintenance of health and fitness. Awareness about the alternative systems for health and fitness ayurveda, yoga, Meditation, vegetarianism and traditional diets.	**15**
		45
Practical:	1. Market survey of commercial nutritional supplements and nutritional support substrates 2. Visit to yoga and meditation centers 3. Assessment of nutritional status using physical methods 4. Planning diets and formulating dietary guidelines for: • Fitness and health • Prevention of Chronic degenerative disorders • Obesity management • Management of diabetes mellitus and CVD	**30**

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	SDG 3: Good Health and Well-Being: Organize yoga, meditation, or fitness sessions in villages/ cities.	

Suggested Readings:

1. Sizer, F.& Whitney, E. (2002): Nutrition – Concepts & controversies, 8th Edition, wadswort Thomson Learning.
2. Mahan, L.K. &Ecott-Stump, S. (2000): Krause's Food, Nutrition and Diet Threapy, 10th Ed W.B.Saunders Ltd.
3. Ira Wolinksy (Ed) (1998): Nutrition in Exercise and sports, 3rd Edition, CRC Press.
4. McArdle, W. Katch, F. and Katch, V. (1996) Exercise Physiology. Energy, Nutrition and H Performance, 4th edition, Williams and Wilkins, Philadelphia.
5. Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999): Modern Nutrition in Health Disease, 9th Edition Williams &wilkins.
6. Parizkova, J. Nutrition, Physical activity and health in early life.Ed. Wolinksky, CRCPress.

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DEPARTMENT OF HOME SCIENCE
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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
I YEAR/ II SEM
Course Code- DEC-2
FOOD PACKAGING AND SENSORY EVALUATION
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: First**	**Semester: II**

Course Description: This course offers a comprehensive understanding of food packaging systems, focusing on the types of packaging materials, their properties, and their importance in preserving food quality and safety. It equips students with the skills to test and evaluate packaging media, understand packaging laws and regulations, and make informed decisions regarding suitable packaging for different food products. Additionally, the course introduces students to the principles and methods of sensory evaluation used to assess food quality from a consumer perspective.

Course Code: DEC-2	**Course Title: FOOD PACKAGING AND SENSORY EVALUATION**

Course Objective: This course is designed to enable students to

- Gain knowledge about various packaging materials and importance of packaging.
- Be familiar with testing and evaluation of packaging media.
- Be familiar with packaging laws and regulations.
- Be able to select appropriate packaging material for a variety of foodstuffs.
- Be able to perform sensory evaluation of food product.

Course Outcomes: Upon successful completion of this course, students will be able to:

1. Explain the types, functions, and significance of various food packaging materials.
2. Identify and evaluate the physical, chemical, and mechanical properties of packaging media through standard testing methods.
3. Demonstrate understanding of national and international packaging laws, labelling requirements, and food safety regulations.
4. Select appropriate packaging materials for different types of food products based on their physical and chemical properties.
5. Perform sensory evaluation of food products using appropriate techniques and interpret the results to assess food quality and consumer acceptability.

Credits: 3+1	**Course Type- Elective Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	Topic	No. of Lectures
I	**PACKAGING** Concepts, definition, significance, classification, Development process.	5
II	**PACKAGING SYSTEM AND METHODS FOR FOOD PRODUCTS** Packing types, varieties and trends: Vacuum packaging, gas flush, packaging, CAP & MAP, Aseptic and retort packing, Bag-in Box.	11
III	**PACKAGING –LAWS AND REGULATION** FDA, PFA, Packaging commodity Rules, Weight and Measure Act.	12

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IV	**SENSORY EVALUATION** Introduction to sensory analysis and uses of sensory tests. Types of tests: - Discrimination/difference test: paired test, triangle test, and duo-trio test, test for multiple samples, and difference from control/reference. - Quantitative Difference tests: Ranking, numerical Scoring test, magnitude estimation. - Descriptive Test: Rating for sensory profile, consensus profiling, conventional profiling, free choice profiling. - Threshold tests - Acceptance test: Monadic, paired and sequential monadic.	**17**
		45
Practical:	• Establishing sensory panels: Selecting and recruiting panelists, orienting, Screening for trained panels, training panelist, monitoring performance. Recognition test for basic tastes, odour and aroma. Tests with other senses. Threshold tests. • Analytical tests: i) Difference ii) Ranking iii) Descriptive iv) Scoring v) Rating SDG 9: Industry, Innovation and Infrastructure: Design affordable home appliances using recycled materials.	**30**

Suggested Readings:

1. Sacharow&Grifin, Food Packaging-AVI Publications
2. Hotchikiness Food & packaging interaction- American Chemical Society.
3. Robertson G.L.Food packaging- New York, Marcell Dekker, Inc.
4. Lyon, D.H.; Francombe, M.A.; Hasdell, T.A.; Lawson, K. (eds) (1992): Guidelines for sensory Analysis in Food Product Development and Quality Control. Chapman and Hall London.
5. Amerine, M.A,;Pangborn, R.M.;Roessler, E.B.(1965): Principles of sensory Evaluation. Acader Press, New York.
6. Kapsalis, J.G.(1987): Objective Methods in Food Quality Assessments.CRC Press, Florida.
7. Jellinek, G.(1985): Sensory Science Theory and Applications in Foods. Marcel Dekker Inc. York.
8. Piggot, j.r.(ed) (1988): Sensory Analysis of Foods. Elsevier applied Science, London.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
I YEAR/ II SEM
Course Code- CC-6
CONSTITUTIONAL, HUMAN VALUES AND MORAL VALUES AND IPR
(2 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: First**	**Semester: II**
Course Description: As per University Guidelines		
Course Code: CHM	**Course Title: CONSTITUTIONAL, HUMAN VALUES AND MORAL VALUES AND IPR**	
Course Objective:As per University Guidelines		
Course Outcomes:As per University Guidelines		
Credits: 2	**Course Type- Value Added Course**	
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)	
Total No. of Lectures: As per University Guidelines		

Units	**Topic**	**No. of Lectures**
I	Constitutional Values: Historical perspective of Indian Constitution; Preamble values; Constitutional Morality; Patriotic values for nation-building; Fundamental Rights/Duties; Directive Principles.	8
II	Humanistic Values: Humanism, virtues, civic sense; Social responsibilities; Ethical handling of aspirations; Harmony with society/nature; International peace (Vasudhaiva Kutumbakam).	7
III	Moral Values & Professional Conduct: Understanding morality; Moral education/character building; Ethics in personal/social/professional relations; Gender sensitization; Support for weaker sections (SCs/STs/OBCs/EWS/DAs); Ethical conduct in education; Professional ethics.	8
IV	Intellectual Property Rights: Meaning/origins/nature of IPRs; Types (Copyright, Patent, Trademark, Trade Secret, Design, Traditional Knowledge); Infringement remedies/penalties; UGC plagiarism policy basics.	7
		30

Specialization A - Clinical and Therapeutic Nutrition

(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course focuses on the relationship between nutrition and various acute and chronic diseases. It provides students with a foundational understanding of the etiology, physiological, and metabolic alterations associated with disease conditions. Emphasis is placed on the impact of illnesses on nutritional status and the modification of dietary requirements accordingly. Students will learn to assess patient needs and formulate individualized nutritional care plans for both prevention and therapeutic management of diseases, integrating evidence-based dietary guidelines and interventions.

Course Code: CC-9	**Course Title: CLINICAL AND THERAPEUTIC NUTRITION**

Course Objective: This course will enable the students to:

- Understand the etiology, physiological and metabolic anomalies of acute and chronic diseases and patient needs.
- Know the effect of the various diseases on nutritional status and nutritional and dietary requirements.
- Be able to recommend and provide appropriate nutritional care for prevention and treatment of the various diseases.

Course Outcomes: Upon successful completion of this course, students will be able to:

1. Understand and explain the etiology, pathophysiology, and metabolic disturbances associated with acute and chronic diseases.
2. Analyze the effects of different disease states on an individual's nutritional status and dietary needs.
3. Apply knowledge to assess the nutritional requirements of patients with various clinical conditions.
4. Recommend and design appropriate nutritional care plans for the prevention and dietary management of acute and chronic diseases.
5. Demonstrate awareness of the role of nutrition in improving health outcomes and quality of life in clinical settings.

Credits: 3+1	**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	**Topic**	**No. of Lectures**
I	**NUTRITIONAL ASSESSMENT & CARE OF PATIENTS** a) Nutrition care process - Nutrition care process - Nutritional screening and assessment of patients – out patient & hospitalized - Nutritional interpretation of routine medical and laboratory data - Nutrition care plan and implementation - Monitoring and follow up - Ethical issues b) Dietary Counseling c) Nutrition Support: Enteral Nutrition and Parenteral Nutrition.	6

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II	**DIET, NUTRIENT AND DRUG INTERACTION** Effect of drugs on ingestion, digestion, absorption metabolism of nutrients. Effect of food, nutrients and nutritional status on drug dosage and efficacy.	6
III	**WEIGHT MANAGEMENT & DIABETES MANAGEMENT** Etiopathophysiology, metabolic & clinical aberrations, diagnosis, complications, treatment, MNT, dietary counseling and recent advances in a) Weight imbalance disorders – Overweight Underweight b) Diabetes Mellitus – Type 1, Type 2 and Gestational diabetes MRDM	6
IV	**CARDIOVASCULAR DISORDERS & GI TRACT DISORDERS** Etiopathophysiology, metabolic & clinical aberrations, diagnosis, complications, treatment, MNT, dietary counseling and recent advances in a) Cardio Vascular Diseases – hypertension, hyperlipidemia, metabolic syndrome, peripheral and cerebro vascular disease b) Gastrointestinal tract Disorders – GERD, peptic ulcer, diarrhoea, lactose intolerance, disease ,Hiatus Hernia	6
V	**LIVER, BILARY SYSTAM, THYROID GLAND DISORDERS** Etiopathophysiology, metabolic & clinical aberrations, diagnosis, complications, treatment, MNT, dietary counseling and recent advances in a) Liver Diseases- Hepatitis, Cirrhosis of Liver b) Bilary system- Cholelithiasis c) Thyoroid gland- Hyper and hypo thyroidism	7
VI	**RENAL DISORDERS, ANEMIA, ALLERGY, FE AND INFECTION** Etiopathophysiology, metabolic & clinical aberrations, diagnosis, complications, treatment, MNT, dietary counseling and recent advances in Renal Diseases- Glomerulonephritis, Nephrotic Syndrome, Acute and Chronic Renal Failure, ESRD Anemia, Allergy, Fever and Infection	7
VII	**OVERVIEW OF SOME DEGENERATIVE DISORDE** a) Cancer - Role of diet in etiology and management HIV-AIDS b) Alzheimer's disease and Parkinson's disease, Arthritis, GOUT	7
		45
Practical:	1. Market survey of commercial nutritional supplements and nutritional support substrates. 2. Planning and preparations of diets for patients with common multiple disorders and complications and discharge diet plans. 3. Preparation of diet counseling aids for common	30

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	disorders. **SDG 2: Zero Hunger:** Donation Food Drive - Collection of non-perishable food i (aata, rice, dal, sugar, oil) and donating to nearby slum community.	

Suggested Readings:

1. Mahan, L. K. and Escott Stump. S. (2008) *Krause's Food & Nutrition Therapy 12th ed.* Saunders-Elsevier
2. Shils, M.E., Shike, M, Ross, A.C., Caballero B and Cousins RJ (2005) *Modern Nutrition in Health and Disease. 10th ed.* Lipincott, William and Wilkins.
3. Gibney MJ, Elia M, Ljungqvist&Dowsett J. (2005) *Clinical Nutrition.* The Nutrition Society Textbook Series. Blackwell Publishing Company.
4. 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.
5. Lee RD & Neiman DC. (2009). Nutritional Assessment. 5th edition. Brown & Benchmark.

M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization A- CLINICAL AND THERAPEUTIC NUTRITION
Course Code- CC-10
INSTITUTIONAL FOOD MANAGEMENT
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course is designed to build foundational and practical knowledge in the field of Institutional Food Management. It covers essential aspects of planning, organizing, and managing large-scale food service operations in various institutional settings such as hospitals, hostels, schools, and corporate canteens. The course emphasizes real-world applications by offering field-level exposure and developing managerial skills required for effective food service administration. It also fosters entrepreneurial abilities, equipping students with the expertise to establish and run their own food service ventures.

Course Code: CC-10	**Course Title: INSTITUTIONAL FOOD MANAGEMENT**

Course Objective:

- To develop a knowledge base in key areas of Institutional Food Management.
- To provide Practical field level experience in institutional Food Administration.
- To impart necessary expertise to function as a food service manager.
- To equip individuals to start their own food service unit leading to entrepreneurship.

Course Outcomes: Upon successful completion of this course, students will be able to:

1. Demonstrate knowledge of key concepts and practices in institutional food management and administration.
2. Apply principles of menu planning, food production, hygiene, staffing, budgeting, and equipment management in institutional settings.
3. Gain practical experience through field visits or internships to understand real-time institutional food service operations.
4. Develop managerial competencies required for planning, supervising, and evaluating food service systems.
5. Design and plan a food service unit, promoting entrepreneurship and self-employment opportunities in the food service sector.

Credits: 3+1	**Course Type- Core Course**

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Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	Topic	No. of Lectures
I	**HISTORICAL PERSPECTIVE OF FOOD SERVICE** • Evolution of the food service industry • Kinds of food service systems Conventional, commissary, ready prepared, assembly/ serve	5
II	**UNIT II: MANAGEMENT & ORGANIZATION** **Management Theories** Classical, Scientific, Behavioural, Systems approach, Contingency approach, MBO, JIT, TQM **Managerial operations** a) Functions of management /manager b) Principles of management c) Definition of Organization and steps in organizing **Tools of Management** a) Tangible Tools: Organization chart, Job description, Job specification, Job analysis: Path way chart, Process chart, Work schedule, Production schedule, Staff and service analysis, Budget b) Intangible tools: Communication, Leadership, Decision making	10
III	**MATERIAL MANAGEMENT** a) Menu planning: Functions, Factors affecting menu planning, Menu construction, Types of menu, Menu card, Qualifications of menu planners b) Purchase:– Market, Buyer, Vendor, Methods of Purchase: Formal and Informal, Purchasing procedure c) Storage: Types of storage, Store room requirement, Appropriate temperature for storage of different foods, Storeroom Records d) 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. e) Food delivery and service: Centralized and decentralized, factors affecting selection, Styles of service, delivery and service equipment.	15

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IV	**MANPOWER MANAGEMENT** • Manpower Planning: Functions of a personnel manager, Need of Unit Menu, type of operations, Type of service, Jobdescription and jobspecification • Manpower placement: Recruitment: Process and Sources-Internal and External a. Selection: Process interview, Tests b. Orientation: Importance, Content of programme, Developing an Orientation programme c. Training: Importance; Types - OJT, Group; continuous training, training for development Developing a training programme d. Contract negotiation with employee : appointment letter, establishment of wages, components of wages , rules and regulations, duties, and service and benefits , contact with vendors e. Performance appraisal: Importance, Methods, Limitations f. Leadership: Importance; Styles, traits and skills g. Motivation: Role; Motivation theories and their application-Content theories: Maslow, Herzberg, McClelland; Process theories: Vroom, h. Equity; Reinforcement theory; Motivational plan and incentives i. Dealing with organizational behavior: Absenteeism, Labor turnover, conflict j. Trade unions and collective bargaining, Labor Laws and policies.	**15**
		45
Practical:	1. Market survey and analysis of processed and fir products. **2.** Planning Menus for quantity (Any of three) i. Banquet 1. Outdoor catering 2. Canteens 3. Packed meals 4. Food service units in Hostel 3. Standardizing recipes for quantity for 100. 250, 500. 4. Any two of the following 5. Snacks 6. Cereal preparations 7. Cakes 8. Curry preparations 9. Canteen Project **SDG 2: Zero Hunger:** Community Kitchens - Set up kitchen to provide regular meals to the homeless or underprivileged.	**30**
Suggested Readings:		

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1. West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised By H FV, Shuggart SG, &Palgne Palacio June, Macmillian Publishing Company New York.
2. SethiMohini (2005) Institution Food Management New Age International Publishers
3. Tripati P C & Reddy PW (2008) Principles of Management 3rd edition Tata McGraw Hill Boo Company.
4. Knight J B &Kotschevar LH (2000) Quantity Food Production Planning & Management 3rd edition
   John Wiley & Sons.
5. Dessler Gary (2007) Human Resource Management 11th edition Prentice Hall New Jersey.
6. Luthans Fred (2004) Organizational Behavior 10th Edition McGraw Hill International.

M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization A- CLINICAL AND THERAPEUTIC NUTRITION
Course Code- DEC-3
ASSESSMENT OF NUTRITIONAL STATUS
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**
Course Description: This course is designed to familiarize students with advanced methodologies used in the assessment and surveillance of nutritional status among individuals and population groups. It emphasizes both theoretical understanding and hands-on skill development in commonly used techniques for evaluating dietary intake, anthropometry, biochemical and clinical indicators. The course aims to equip students with the ability to critically apply appropriate methods in diverse community and clinical settings for effective monitoring and planning of nutrition-related programs and interventions.		
Course Code: DEC-3	**Course Title: ASSESSMENT OF NUTRITIONAL STATUS**	
Course Objective: The course is designed to: • Orient the students with the important state of the art methodologies applied in nutritional assessment and surveillance of human groups. • Develop specific skills to apply the most widely used methods.		
Course Outcomes: Upon successful completion of this course, students will be able to: 1. Explain and differentiate between various methods of nutritional assessment including dietary, anthropometric, clinical, and biochemical approaches. 2. Understand the principlesand applications of nutritional surveillance in public health and community settings. 3. Select and apply appropriate tools and methodologies for assessing nutritional status of individuals and groups. 4. Develop skills to conduct field-level nutritional assessments with accuracy and reliability. 5. Interpret and analyze nutritional assessment data for effective planning, intervention, and policy formulation.		
Credits: 3+1		**Course Type- Elective Course**
Max. Marks: **Semester:** Theory (70) + Practical (30)		**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10)

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Sessional: Theory (20) + Practical (15)	**Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	Topic	No. of Lectures
I	**NUTRITIONAL ASSESSMENT** • Nutritional assessment as a tool for improving the quality of life of various segments of the population including hospitalized patients • Current methodologies of assessment of nutritional status, their interpretation and comparative applications of the following: □ Food Consumption (Dietary assessment) □ Anthropometry □ Clinical and Laboratory □ Rapid Assessment and PRA	15
II	**NUTRITIONAL SURVEILLANCE** Basic concepts, uses, and setting up of the surveillance systems.	15
III	**MONITORING AND EVALUATION** Definition, significance and purpose of monitoring and evaluation the food and Nutrition programmes.	15
		45
Practical:	1. Training in all assessment techniques applicable for individuals and community, including ones used for hospitals- based patients - Validity and reliability of these techniques 2. Community based project for assessment of nutritional status of any vulnerable group 3. A small evaluation study of a nutrition project. **SDG 11: Sustainable Cities and Communities** up recycling corners in college or hostels	30

Suggested Readings:

1. Jelliffe, D.B. and jelliffe, E.F.P. (1989): Community Nutritional Assessment, Oxford Univers Press.
2. Beghin, I., Cap, M. and Dujardan, B.(1988): A Guide to Nutritional Status Assessment, WHO Geneva.
3. Gopaldas, T. and Seshadri, S. (1987): Nutrition Monitoring and Assessment, Oxford Universi Press.
4. Lee, R.D. and Neiman, D.C.(1993): Nutritional Assessment, Brown and Benchmark Publishe
5. Sauberlich, H.E.(Ed) (1999): Laboratory Test for the Assessment of Nutrition Status, CRC Pr

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization A- CLINICAL AND THERAPEUTIC NUTRITION
Course Code- DEC-4
PEDIATRIC NUTRITION
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course provides an in-depth understanding of the nutritional management of acute and chronic diseases, with a special focus on pediatric nutrition. Students will explore the etiology, physiological, and metabolic disturbances associated with various disease conditions and learn to assess patient needs effectively. The course equips learners with the skills to recommend and implement appropriate nutritional care strategies for both prevention and treatment. Additionally, it emphasizes the specialized nutritional needs of pediatric patients, including premature infants, and prepares students to set appropriate nutrient goals tailored to this sensitive population.

Course Code: DEC-4	**Course Title: PEDIATRIC NUTRITION**

Course Objective: This course will prepare the students to:

- Understand the etiology, physiological and metabolic anomalies of acute and chronic diseases and patient needs.
- Be able to recommend and provide appropriate nutritional care for prevention and treatment of the various diseases.
- The goal of pediatric nutrition continuing education course is to expand the knowledge and skills of dietician in assessing and treating pediatric patients
- Understand to use knowledge regarding premature infants to select appropriate nutrient goals

Course Outcomes: Upon successful completion of this course, students will be able to:

1. Explain the etiology and metabolic and physiological alterations associated with acute and chronic diseases.
2. Assess the nutritional needs of patients and recommend suitable dietary interventions for disease prevention and management.
3. Apply knowledge of pediatric nutrition to assess, plan, and implement dietary care for infants, children, and adolescents.
4. Demonstrate competence in addressing the nutritional needs of premature and critically ill pediatric patients, including setting appropriate nutrient goals.
5. Integrate evidence-based practices into clinical decision-making for the nutritional care of diverse patient populations.

Credits: 3+1	**Course Type- Elective Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	Topic	No. of Lectures
I	**INTRODUCTION** • Historical development of Pediatrics. • National Health Policy for Children. • National Health Program related to child health.	5
	INBORN ERRORS OF METABOLISM • Inborn errors of metabolism of the following	15

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II	a) Carbohydrate metabolism disorders (like galactosemia) b) Amino acid metabolism disorders (like phenylketonuria) c) Fatty acid metabolism disorders (like MCAD deficiency) d) Urea cycle disorders (such as citrullinemia) e) Organic acidemias (such as maple syrup urine disease) f) Mitochondrial disorders (such as MELAS)	
III	**MATERNAL AND CHILD NUTRITION** • Maternal nutrition (physiological changes, psychological changes, weight gain in pregnancy, RDA in pregnancy, complexities in pregnancy) • Antenatal care &post natal care (Colostrum, prelacteals) • Infant nutrition (breast feeding, weaning, complementary feeding, formula feeding), feeding of the infant i.e. development of GIT • LBW, Pre-term babies	**15**
IV	**NUTRITIONAL SUPPORT IN DISEASES OF CHILDREN** • Immunization • Cystic fibrosis, HIV, Wilson's disease, Jaundice, Renal diseases.	**10**
		45
Practical:	• To Visit Pediatric Ward of any Hospital and record challenges associated with care of infants and children. • To visit aganwadi centre of nearby rural/urban area and take record of their working. **SDG 1: No Poverty:** Collect and distribute essential kits (food, clothes, hygiene) to needy families.	**30**

Suggested Readings:

1. Mahan, L. K. and Escott Stump. S. (2008) *Krause's Food & Nutrition Therapy 12th ed.* Saund Elsevier
2. Shils, M.E., Shike, M, Ross, A.C., Caballero B and Cousins RJ (2005) *Modern Nutrition in H and Disease. 10th ed.* Lipincott, William and Wilkins.
3. *Pediatric Nutrition*, Suraj Gupta, Edition II, Peepee Publishers and Distributors, Delhi, India, 2012
4. *Pediatric Nutrition,* Ronald E. Kleinman, MD, FAAP & Frank R. Greer, Edition VII, AAP Committee on Nutrition, 2013
5. Baker SS, Baker RD and Davis AM. *Pediatric Nutrition Support*. Sudbury, MA: Jones and Bartlett Publishers; 2007

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization A- CLINICAL AND THERAPEUTIC NUTRITION
Course Code- DEC-5
CURRENT TRENDS & ISSUES IN FOOD & NUTRITION
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course offers an in-depth exploration of current and emerging topics in the fields of nutrition, food science, and public health. It encompasses the study of horticulture and olericulture, genetically modified foods, nutraceuticals, and functional foods, while also examining contemporary trends in food processing such as fermentation, probiotics, and food fortification. Special focus is placed on the nutritional management of lifestyle diseases and the role of trace minerals in health. The course also integrates recent developments in public nutrition programs and policies, along with student-led seminars to promote research, critical thinking, and communication skills.

Course Code: DEC-5	**Course Title: CURRENT TRENDS & ISSUES IN FOOD & NUTRITION**

Course Objective: By the end of this course, students will be able to:

- Understand the significance of horticulture, olericulture, and genetically modified foods in modern nutrition.
- Define and classify nutraceuticals, nutri-genomics, and functional foods and evaluate their role in disease prevention.
- Examine new trends in food processing, including the use of fermented products, probiotics, and food fortification techniques.
- Analyze the nutritional and dietary implications of lifestyle diseases and trace element deficiencies.
- Critically evaluate national strategies and recent initiatives in public nutrition and education.
- Develop research and presentation skills through seminar participation.

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

- Explain the advantages and disadvantages of genetically modified foods and their impact on health and agriculture.
- Demonstrate an understanding of nutraceuticals, nutri-genomics, and functional foods in the context of personalized nutrition.
- Identify and describe fermented foods, probiotics, prebiotics, single cell proteins, and their benefits in the food industry.
- Assess the importance of micronutrients like zinc and manganese and understand disorders like PICA and celiac disease from a nutritional perspective.
- Evaluate current public nutrition strategies and discuss recent advancements in nutrition education programs.
- Present and discuss current issues and trends in food and nutrition through seminars, showcasing critical analysis and communication skills.

Credits: 3+1	**Course Type- Elective Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	**Topic**	**No. of Lectures**

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I	**HORTICULTURE AND OLERICULTURE** • Genetically modified foods- advantages and disadvantages • Nutraceuticals, Nutri-genomics And Nutri-genetics- definition, classification, importance • Functional foods • Antioxidants and pigments	**10**
II	**TRENDS IN FOOD PROCESSING INDUSTRY** • Fermented foods- importance, benefits and examples • Pro-biotics and pre-biotics, single cell protein • Food fortification, enrichment, supplementation, medical foods	**10**
III	**LIFESTYLE DISAESES** • Role of zinc and manganese in health • PICA and Celiac Disease- causes, prevention and diet	**10**
IV	**RECENT DEVELOPMENTS IN PUBLIC NUTRITION** • Current strategies and programmes to combat public nutrition • Recent advances in nutrition education programme	**15**
		45
Practical:	1- Seminar on current trends and issues in food and nutrition **SDG 14: Life Below Water:** Raise awareness on the harmful effects of detergents and chemicals.	**30**

Suggested Readings:

1. Jwels of foods and nutrition, Dr. R. V. Raval, Department of Home Science, Saurashtra University, Rajkot.
2. WHO – Technical report series.
3. Garrow, J.S. James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietitics, 10th Edition, Churohill Livingstone.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization A- CLINICAL AND THERAPEUTIC NUTRITION
Course Code- OEC
DISSERTATION
(2 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course is designed to equip students with the foundational knowledge and practical skills required for preparing a research synopsis. It emphasizes the critical steps involved in initiating a research project—ranging from topic selection to hypothesis formulation, sampling design, development of research tools, and standardization of procedures. Students will also gain competence in applying statistical methods for data analysis and citing sources using APA (7th edition) referencing style. The course culminates in the structured presentation of the research synopsis, thereby enhancing students' academic writing and presentation skills.

Course Code: OEC	**Course Title: DISSERTATION**

Course Objective: By the end of this course, students will be able to:

- Understand the process of selecting a meaningful and researchable topic.
- Formulate clear and achievable research objectives and hypotheses.
- Design appropriate research methodologies and sampling strategies.
- Develop and validate effective tools for data collection.
- Apply standardization techniques and ethical practices in data collection.
- Perform basic statistical analysis for interpreting research data.
- Use correct APA 7th edition referencing and citation format.
- Present a comprehensive and well-structured research synopsis.

Course Outcomes: Upon successful completion of the course, students will be able to:

- Select and define a relevant research problem with academic and societal significance.
- Frame specific objectives and hypotheses aligned with the research topic.
- Design a suitable research methodology including sampling technique and sample size determination.
- Construct or select appropriate tools such as questionnaires, interview schedules, and rating scales for data collection.
- Standardize research tools and procedures to ensure reliability and validity.
- Apply relevant statistical techniques for data analysis and interpretation.
- Accurately cite sources and prepare a reference list using APA 6th edition style.
- Effectively communicate their research plan through a formal synopsis presentation.

Credits: 1+1	**Course Type- Open Elective**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (15) +Practical (30)

Units	**Topic**	**No. of Lectures**
I	Preparation of the synopsis in context of the following points- 1. Selection of the research topic 2. Objectives 3. Research Design 4. Formulation of Hypothesis	15

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	5. Sampling design and size 6. Selection/ Development of tools for data collection, e.g. Questionnaire, Interview Schedule, Observation, Rating Scale etc. 7. Standardization of procedures (as per requirement) 8. Statistical Analysis 9. References and Citations (APA Style, 6th Edition) 10.Presentation	
		15
Practical:	1- Presentation of Synopsis and viva based on synopsis	**30**

Suggested Readings:

Kothari, C. R., & Garg, G. (2019). *Research Methodology: Methods and Techniques* (4th ed.). New Age International Publishers.
→ Comprehensive guide covering research design, hypothesis, sampling, and statistical analysis.
Kumar, R. (2019). *Research Methodology: A Step-by-Step Guide for Beginners* (5th ed.). SAGE Publications.
→ Beginner-friendly book for selecting a topic, setting objectives, and data collection tools.
Best, J. W., & Kahn, J. V. (2016). *Research in Education* (10th ed.). Pearson.
→ Especially useful for understanding educational and social science research methodology.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization B- PUBLIC HEALTH NUTRITION
Course Code- CC-9
PUBLIC HEALTH NUTRITION
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course introduces students to the foundational concepts and scope of public health nutrition, emphasizing its role in enhancing community health and well-being. It explores the structure and functioning of the national health care delivery system, while addressing prevailing public health and nutritional concerns in India. Students will examine demographic trends and their influence on nutritional requirements and the quality of life. The course also investigates the socio-economic impact of malnutrition and equips students with strategies and policy-level approaches to improve the nutritional status of diverse population groups.

Course Code: CC-9	**Course Title: PUBLIC HEALTH NUTRITION**

Course Objective:

- To understand the concept of public health nutrition.
- To be familiar with the national health care delivery system.
- To learn about the current concerns in public health nutrition.
- To understand the demographic transition and its implications on the quality of life.
- To understand the economic consequences of malnutrition.
- To learn about the strategies for improving the nutritional status of communities.

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

1. Explain the concept and importance of public health nutrition in the context of national and global health.
2. Describe the structure and components of the national health care delivery systemand its role in addressing nutritional challenges.
3. Analyze current public health nutrition concerns, including undernutrition, overnutrition, and micronutrient deficiencies.
4. Interpret demographic transitions and their implications on nutritional needs and quality of life across population groups.
5. Assess the economic consequences of malnutrition, including its impact on national development and productivity.
6. Formulate and evaluate strategies and interventions to improve the nutritional status of communities using evidence-based approaches

Credits: 3+1	**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	**Topic**	**No. of Lectures**
I	**PUBLIC HEALTH NUTRITION AND HEALTH CARESYSTEM** Aim, scope and content of public health nutrition Current Concerns in Public Health Nutrition: An Overview Role of public health nutritionists in national development	**10**

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	Health – definition, dimensions, determinants, indicators – Community Health Care. National Health Care Delivery System	
II	**POPULATION DYNAMICS** Demographic transition Population structure: Implications on quality of life Population Policy	**10**
III	**HEALTH ECONOMICS AND ECONOMICS MALNUTRITION –** IMPACT ON PRODUCTIVITY AND NATIONAL DEVELOPMENT	**10**
IV	**APPROACHES/ STRATEGIES FOR IMPROV NUTRITION STATUS AND HEALTH STATUS OF COMMUNITY** Health based interventions including immunization, provision of safe drinking water/ sanitation, prevention and management of diarrhoeal diseases Food based interventions including food fortification, dietary diversification, supplementary feeding biotechnological approaches. Education based interventions including growth monitoring and promotion (GMP), health/ nutrition related behavior change communication	**15**
		45
Practical:	Development of plan for a nutrition intervention project community. Development of low cost nutritive recipes suitable for various vulnerable groups at micro, meso and macro levels. Planning and preparation of diet/ dishes for PEM, VAD and IDA. Field visits to ongoing national nutrition programmes. **SDG 3: Good Health and Well-Being:** Set up a mobile health camp (dental, eye, breast cancer, seasonal diseases) in collaboration with local clinics.	**30**

Suggested Readings:

1. Achaya, K.T. (Ed) (1984) *Interface Between Agriculture, Nutrition and Food Science*,
2. Beaton, G. H and Bengoa, J. M. (Eds) (1996) *Nutrition in Preventive Medicine*, WHO.
3. Gibney M.J., Margetts, B.M., Kearney, J. M. Arab, I., (Eds) (2004) *Public Health Nutrition*, NS Blackwell Publishing.
4. Gopalan, C. (Ed) (1987) Combating Under nutrition – *Basic Issues and Practical Approaches* Nutrition Foundation of India.
5. Kaufman M. (2007) *Nutrition in promoting the public health strategies, principles and practi* Jones and Bartlett Publishers.
6. Park, K. (2009) *Park's Textbook of Preventive and Social Medicine, 20th ed.* Jabalpur M/s. BanarsidasBhanot.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization B- PUBLIC HEALTH NUTRITION
Course Code- CC-10
MATERNAL AND CHILD HEATH
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course explores the physiological, nutritional, and developmental changes that occur throughout the human life cycle, with an emphasis on the critical stages from conception to adolescence. It provides in-depth understanding of maternal nutrition during pregnancy and lactation, and its impact on both mother and child. The course also examines growth patterns and developmental milestones, highlighting the crucial role of nutrition in supporting healthy development. Students will gain the knowledge necessary to assess nutritional needs and design appropriate dietary strategies to optimize health across these life stages.

Course Code: CC-10	**Course Title: MATERNAL AND CHILD HEATH**

Course Objective: This course is designed to enable the students to:

- Understand physiological changes in pregnancy and lactation.
- Get acquainted with growth and developmental changes from conception till adolescence.
- Understand the inter-relation between nutrition and growth and development during life cycle

Course Outcomes: On successful completion of this course, students will be able to:

1. Explain the physiological changes and nutritional needs during pregnancy and lactation.
2. Describe the stages of human growth and development from conception to adolescence.
3. Analyze the relationship between nutrition and physical, cognitive, and emotional development at different life stages.
4. Evaluate the impact of maternal and early childhood nutrition on long-term health outcomes.
5. Develop age-appropriate nutritional plans to promote optimal growth and development.

Credits: 3+1	**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	Topic	No. of Lectures
I	**MATERNAL AND CHILD NUTRITION** • Current Nutrition and Health status of Women and children in India. • Changing concepts and controversies in Maternal and Child Nutrition.	10
II	**IMPORTANCE OF MATERNAL NUTRITION** • Importance of nutrition prior to and during pregnancy. • Pre- requisite for successful outcome. Effect of under-nutrition on mother-child dyad including pregnancy outcome maternal and child Health- Short term and long term. • Physiology and endocrinology of pregnancy and embryonic and fetal	12

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	growth and development. • Nutritional requirements during pregnancy • Adolescent Pregnancy • Pregnancy HIV and AIDS • Pregnancy and TB • Intra-uterine growth retardation • Complications of pregnancy and management and importance of antenatal care. • Congenital malformation, fetal alcohol syndrome and gestational diabetes mellitus.	
III	**LACTATION** • Development of mammary tissue and role of hormones • Physiology and endocrinology of lactation- synthesis of milk components let down reflex, role of hormones, lactation amenorrhea, effect of breast feeding on maternal health. • Nutrient requirement during lactation – Factorial method • Human Milk composition and factors affecting breastfeeding and fertility. • Management of lactation - Prenatal breastfeeding and fertility • Exclusive breastfeeding	**13**
IV	**FEEDING OF INFANTS AND CHILDREN AND DIETARY MANAGEMENT** • Feeding practices • Problems during teething • Growth monitoring • Immunization • Management of Preterm and LBW	**10**
		45
Practical:	Community survey for assessing the nutritional status of maternal &child health. **SDG 5: Gender Equality:** Organize panel discussions or street plays on women's rights. Celebrate "Women's Day" with community storytelling and achievements.	**30**

Suggested Readings:

1. International Food Policy Research Institute (1997). Care and nutrition: Concept and

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measurement. International Food Policy Research Institute Washington DC., USA.
2. Alderman, H.;Behrman, J.; Lavy, V.; Menon, R. (1997) Child Nutrition, Child Health and School Enrollment. Policy Research Working Paper 1700. Washington DC. World Bank.
3. UNICEFF (1997) . The care Intitiative: Assessment, Analysis and Action to improve for Nutrition. New York, UNICEF
4. WHO / University of California, Davis (1998) Complementary Feeding of young children in Developing countries.
5. WHO (1999) Nutrition for Health and development: Progress and prospects

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization B- PUBLIC HEALTH NUTRITION
Course Code- DEC-3
ASSESSMENT OF NUTRITIONAL STATUS
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course is designed to familiarize students with advanced methodologies used in the assessment and surveillance of nutritional status among individuals and population groups. It emphasizes both theoretical understanding and hands-on skill development in commonly used techniques for evaluating dietary intake, anthropometry, biochemical and clinical indicators. The course aims to equip students with the ability to critically apply appropriate methods in diverse community and clinical settings for effective monitoring and planning of nutrition-related programs and interventions.

Course Code: DEC-3	**Course Title: ASSESSMENT OF NUTRITIONAL STATUS**

Course Objective: The course is designed to:

- Orient the students with the important state of the art methodologies applied in nutritional assessment and surveillance of human groups.
- Develop specific skills to apply the most widely used methods.

Course Outcomes: Upon successful completion of this course, students will be able to:

- Explain and differentiate between various methods of nutritional assessment including dietary, anthropometric, clinical, and biochemical approaches.
- Understand the principlesand applications of nutritional surveillance in public health and community settings.
- Select and apply appropriate tools and methodologies for assessing nutritional status of individuals and groups.
- Develop skills to conduct field-level nutritional assessments with accuracy and reliability.
- Interpret and analyze nutritional assessment data for effective planning, intervention, and policy formulation.

Credits: 3+1	**Course Type- Elective Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	**Topic**	**No. of Lectures**
I	**NUTRITIONAL ASSESSMENT** • Nutritional assessment as a tool for improving the quality of life of various segments of the population including hospitalized patients • Current methodologies of assessment of nutritional status, their interpretation and comparative applications of the following: ☐ Food Consumption (Dietary assessment) ☐ Anthropometry ☐ Clinical and Laboratory ☐ Rapid Assessment and PRA	**15**
	NUTRITIONAL SURVEILLANCE	**15**

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II	Basic concepts, uses, and setting up of the surveillance systems.	
III	**MONITORING AND EVALUATION** Definition, significance and purpose of monitoring and evaluation the food and Nutrition programmes.	**15**
		45
Practical:	4. Training in all assessment techniques applicable for individuals and community, including ones used for hospitals- based patients - Validity and reliability of these techniques 5. Community based project for assessment of nutritional status of any vulnerable group 6. A small evaluation study of a nutrition project. **SDG 11: Sustainable Cities and Communities** up recycling corners in college or hostels	**30**

Suggested Readings:

6. Jelliffe, D.B. and jelliffe, E.F.P. (1989): Community Nutritional Assessment, Oxford Univers Press.
7. Beghin, I., Cap, M. and Dujardan, B.(1988): A Guide to Nutritional Status Assessment, WHO Geneva.
8. Gopaldas, T. and Seshadri, S. (1987): Nutrition Monitoring and Assessment, Oxford Universi Press.
9. Lee, R.D. and Neiman, D.C.(1993): Nutritional Assessment, Brown and Benchmark Publishe
10. Sauberlich, H.E.(Ed) (1999): Laboratory Test for the Assessment of Nutrition Status, CRC Pr

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization B- PUBLIC HEALTH NUTRITION
Course Code- DEC-4
COMMUNITY HEALTH NUTRITION
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course introduces students to the field of public health nutrition, emphasizing its role in promoting overall health and preventing disease within communities. It provides foundational knowledge on the interpretation and use of vital statistics for public health planning and policy-making. Additionally, the course familiarizes students with key national and international nutrition and health programs aimed at improving societal well-being. Through this course, students will develop a broad understanding of the strategies and systems that support public health nutrition and welfare.

Course Code: DEC-4	**Course Title: COMMUNITY HEALTH NUTRITION**

Course Objective: This course will prepare the students to:

- Understand the area of nutrition focuses on the promotion of good health
- Understand the importance of vital statistics
- Gain knowledge about national and international programmes running for the welfare of society.

Course Outcomes: Upon successful completion of the course, students will be able to:

1. Explain the concept and scope of public health nutrition and its role in promoting good health.
2. Interpret vital statistics and understand their relevance in assessing population health status.
3. Identify and describe major national and international health and nutrition programmes.
4. Evaluate the effectiveness of welfare initiatives targeted toward improving community nutrition.
5. Demonstrate an understanding of the link between policy, planning, and nutrition interventions for societal well-being.

Credits: 3+1	**Course Type- Elective Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	Topic	No. of Lectures
I	**CONCEPT OF COMMUNITY NUTRITION** • Community-definition, types, characteristics • Community nutrition • Scope of community nutrition	10
II	**VITAL STATISTICS** • Introduction & definition of vital statistics • Scenario in India • Vital records • Specific vital statistics	10
	NATIONAL NUTRITION PROGRAMMME	15

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III	• NIN • CFTRI • FITTEST • FNB • ICDS • MDM • ANP • SNP • CNP • BALWADI NUTRITION PROGRAM • AGANWADI NUTRITION PROGRAM	
IV	**INTERNATIONAL NUTRITION PROGRAMME** • WHO • UNISEF • UNESCO • FAO • WFB	**10**
		45
Practical:	To study the maternal and child health and challenges faced by mother during nurturing of her child/children through village/community/slum area survey. Backyard Farming - Home gardening in unused spaces in community. **SDG 2: Zero Hunger:** Backyard Farming - Distribution of seeds (Lauki, turai, beans, karela) and plantation and watering in nearby slum community. Follow up till harvesting.	**30**

Suggested Readings:

1. *Community Nutrition In India,* Dr. PrabhaBhisht, Edition I,Star Publication, Agra, U.P., India, 2017
2. *Textbook of Community Nutrition,* Surayatapa Das, Edition III, Academic Publishers, Kolkata, W.B., India, 2018
3. *Community Nutrition*, Nweze Eunice Nnakwe, Edition III, Jones& Bartlett Learning, 2017
4. *Public Health and Community Nutrition,* Elizabeth Eilender, Edition I, Momentum Press, 2016
5. *Nutrition in Public Health(principles, polies and practice),* Arlene Spark,Edition I, CRC Press, may 11 2007

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization B- PUBLIC HEALTH NUTRITION
Course Code- DEC-5
CURRENT TRENDS & ISSUES IN FOOD & NUTRITION
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course offers an in-depth exploration of current and emerging topics in the fields of nutrition, food science, and public health. It encompasses the study of horticulture and olericulture, genetically modified foods, nutraceuticals, and functional foods, while also examining contemporary trends in food processing such as fermentation, probiotics, and food fortification. Special focus is placed on the nutritional management of lifestyle diseases and the role of trace minerals in health. The course also integrates recent developments in public nutrition programs and policies, along with student-led seminars to promote research, critical thinking, and communication skills.

Course Code: DEC-5	**Course Title: CURRENT TRENDS & ISSUES IN FOOD & NUTRITION**

Course Objective: By the end of this course, students will be able to:

- Understand the significance of horticulture, olericulture, and genetically modified foods in modern nutrition.
- Define and classify nutraceuticals, nutri-genomics, and functional foods and evaluate their role in disease prevention.
- Examine new trends in food processing, including the use of fermented products, probiotics, and food fortification techniques.
- Analyze the nutritional and dietary implications of lifestyle diseases and trace element deficiencies.
- Critically evaluate national strategies and recent initiatives in public nutrition and education.
- Develop research and presentation skills through seminar participation.

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

- Explain the advantages and disadvantages of genetically modified foods and their impact on health and agriculture.
- Demonstrate an understanding of nutraceuticals, nutri-genomics, and functional foods in the context of personalized nutrition.
- Identify and describe fermented foods, probiotics, prebiotics, single cell proteins, and their benefits in the food industry.
- Assess the importance of micronutrients like zinc and manganese and understand disorders like PICA and celiac disease from a nutritional perspective.
- Evaluate current public nutrition strategies and discuss recent advancements in nutrition education programs.
- Present and discuss current issues and trends in food and nutrition through seminars, showcasing critical analysis and communication skills.

Credits: 3+1	**Course Type- Elective Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	**Topic**	**No. of Lectures**

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I	**HORTICULTURE AND OLERICULTURE** • Genetically modified foods- advantages and disadvantages • Nutraceuticals, Nutri-genomics And Nutri-genetics- definition, classification, importance • Functional foods • Antioxidants and pigments	**10**
II	**TRENDS IN FOOD PROCESSING INDUSTRY** • Fermented foods- importance, benefits and examples • Pro-biotics and pre-biotics, single cell protein • Food fortification, enrichment, supplementation, medical foods	**10**
III	**LIFESTYLE DISAESES** • Role of zinc and manganese in health • PICA and Celiac Disease- causes, prevention and diet	**10**
IV	**RECENT DEVELOPMENTS IN PUBLIC NUTRITION** • Current strategies and programmes to combat public nutrition • Recent advances in nutrition education programme	**15**
		45
Practical:	2- Seminar on current trends and issues in food and nutrition **SDG 14: Life Below Water:** Raise awareness on the harmful effects of detergents and chemicals.	**30**

Suggested Readings:

1. Jwels of foods and nutrition, Dr. R. V. Raval, Department of Home Science, Saurashtra University, Rajkot.
2. WHO – Technical report series.
3. Garrow, J.S. James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietitics, 10th Edition, Churohill Livingstone.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization B- PUBLIC HEALTH NUTRITION
Course Code- OEC
DISSERTATION
(2 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course is designed to equip students with the foundational knowledge and practical skills required for preparing a research synopsis. It emphasizes the critical steps involved in initiating a research project—ranging from topic selection to hypothesis formulation, sampling design, development of research tools, and standardization of procedures. Students will also gain competence in applying statistical methods for data analysis and citing sources using APA (7th edition) referencing style. The course culminates in the structured presentation of the research synopsis, thereby enhancing students' academic writing and presentation skills.

Course Code: OEC	**Course Title: DISSERTATION**

Course Objective: By the end of this course, students will be able to:

- Understand the process of selecting a meaningful and researchable topic.
- Formulate clear and achievable research objectives and hypotheses.
- Design appropriate research methodologies and sampling strategies.
- Develop and validate effective tools for data collection.
- Apply standardization techniques and ethical practices in data collection.
- Perform basic statistical analysis for interpreting research data.
- Use correct APA 7th edition referencing and citation format.
- Present a comprehensive and well-structured research synopsis.

Course Outcomes: Upon successful completion of the course, students will be able to:

- Select and define a relevant research problem with academic and societal significance.
- Frame specific objectives and hypotheses aligned with the research topic.
- Design a suitable research methodology including sampling technique and sample size determination.
- Construct or select appropriate tools such as questionnaires, interview schedules, and rating scales for data collection.
- Standardize research tools and procedures to ensure reliability and validity.
- Apply relevant statistical techniques for data analysis and interpretation.
- Accurately cite sources and prepare a reference list using APA 6th edition style.
- Effectively communicate their research plan through a formal synopsis presentation.

Credits: 1+1	**Course Type- Open Elective**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (15) +Practical (30)

Units	Topic	No. of Lectures
I	Preparation of the synopsis in context of the following points- • Selection of the research topic • Objectives • Research Design	15

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	• Formulation of Hypothesis • Sampling design and size • Selection/ Development of tools for data collection, e.g. Questionnaire, Interview Schedule, Observation, Rating Scale etc. • Standardization of procedures (as per requirement) • Statistical Analysis • References and Citations (APA Style, 6th Edition) • Presentation	
		15
Practical:	2- Presentation of Synopsis and viva based on synopsis	**30**

Suggested Readings:

Kothari, C. R., & Garg, G. (2019). *Research Methodology: Methods and Techniques* (4th ed.). New Age International Publishers.
→ Comprehensive guide covering research design, hypothesis, sampling, and statistical analysis.
Kumar, R. (2019). *Research Methodology: A Step-by-Step Guide for Beginners* (5th ed.). SAGE Publications.
→ Beginner-friendly book for selecting a topic, setting objectives, and data collection tools.
Best, J. W., & Kahn, J. V. (2016). *Research in Education* (10th ed.). Pearson.
→ Especially useful for understanding educational and social science research methodology.

M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization C- FOOD SCIENCE
Course Code- CC-9
FOOD PROCESSING AND TECHNOLOGY
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**
Course Description: This course provides students with a comprehensive understanding of the fundamental concepts involved in food processing and preservation. It covers key unit operations used in the food industry and their role in ensuring product quality and safety. Students will learn about various food preservation techniques, their underlying principles, and practical applications. The course also focuses on the composition of different food products, use of additives, and identification of common food adulterants, enabling students to evaluate food quality and safety.		
Course Code: CC-9	**Course Title: FOOD PROCESSING AND TECHNOLOGY**	
Course Objective: • To understand concepts of unit operations in processing. • To understand principles of food preservation and its application. • To understand nature of various food products constituents, additives and adulterants.		
Course Outcomes: By the end of the course, students will be able to: 1. Explain the basic concepts of unit operations involved in food processing. Understand mechanical, thermal, and chemical unit operations used in the food industry. 2. Apply principles of food preservation techniques for enhancing shelf life and safety. 3. Demonstrate knowledge of preservation methods like drying, freezing, pasteurization,		

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fermentation, and chemical preservation.

3. Analyze the composition of various food products and their functional properties.Identify the roles of major constituents like carbohydrates, proteins, fats, vitamins, and minerals in food systems.
4. Evaluate the use and safety of food additives.Understand types, functions, and regulations regarding food additives.
5. Identify and assess common food adulterants and their impact on health.Recognize methods for detection and prevention of food adulteration.

Credits: 3+1	**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	Topic	No. of Lectures
I	**UNIT OPERATIONS** **Raw material preparation-** Cleaning, sorting, grading and peeling **Size reduction-** Size reduction of solid foods reduction in liquid foods (Emulsification and homogenization) theory and equipment **Separation and concentration of food components-** Centrifugation, Filtration, Expression, Extraction using solvent, membrane concentration (Hyper filtration and filtration),theory equipment and effects on foods	6
II	**MIXING AND FORMING** Mechanical separation, texture, colour, flavor	5
III	**APPLICATION OF HEAT: THEORY, PROCESSING, EQUIPMENT, EFFECT ON FOOD TEXTURE, COLOUR, FLAVOUR AND NUTRITIONAL VALUE.** **Heat processing using steam or water** **Pasteurization:** theory equipment (Pasteurization of packaged foods and Unpackaged food products), effect on food, colourflavour, aroma and vitamins **Heat sterilization**: In-containers sterilization, theory, retorting and equipments, Ultra high temperature/ aseptic processes: Theory, processing, equipments, effects on food – colour, flavour and aroma, texture and viscosity nutritive value **Evaporation and distillation:** evaporation, effect on food, distillation **Extrusion:** Theory: rheological properties of foods, operating characteristics, equipments- Single screw extruder, twin screw extruder, ancillary, equipments, application, cold extrusion – cooking, effects on food, sensory characteristics and nutritional value	15

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	Heat processing by hot air: dehydration-theory: brine using heated air and heated surfaces, equipments: Hot air driers, heated surface (or contact driers), effects on foods (texture, flavour and aroma, colour nutritional value). **Baking:** Theory, equipments, direct heat, indirect heating and batch ovens, continuous and semi continuous ovens, effect on food texture, flavour aroma and colour and nutritional value.	
IV	**HEAT PROCESSING USING HOT OIL** **Frying:** theory, shallow frying and deep fat frying, equipments, effect on foods, effect of heat on oil and effect of heat on fried foods.	**15**
V	**FOOD COLOURS AND ADDITIVES**	**4**
		45
Practical:	Methods of grading and cleaning of raw materials (grains, spices, fruits and vegetables). Visit to milk and milk products processing industries for exposure of students to measurement of pressure, flow of fluids, heat exchangers and dryers, elevating and conveying equipments, size reduction equipment, sieve analysis, food plant design, and mechanical separators. Estimation of tannins in relation to astringency. Texture analysis of foods by texturometer. Determination and estimation of food additives: nitrites, boric acid, sorbicacid, sulphur dioxide, MSG, sodium chloride, natural and artificial food colors. Determination and estimation of adulterants in foods: honey, fats & oils, spices (turmeric and red chili powder). Estimation of trypsin inhibitor in foods. Carotenoid estimation in fruits and vegetables. Determination of carbon dioxide pressure in carbonated beverages. Effect of heat on Chlorophylls and its estimation in foods by Spectrophotometer. Visit to bread and biscuit industry to observe mixing and forming operations and their equipment. **SDG 8: Decent Work and Economic Growth:** Host workshops on food preservation and packaging for self-employment.	**30**
Suggested Readings:		

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1. Fellows P J (2002), Food Processing Technology- Principles and Practices, 2nd Edition. Woodh Publishing Ltd
2. Harper J C, (1975) Elements of Food Engineering. A VI, West port.
3. Fennema O R, (1985), Principles of Food Science: Part- II Physical Principles of Food Preserva Marcel Decker New York
4. Peter S. Murano (2003), Understanding Food Science and Technology. Peter Marshall Publishe
5. Winton & Winton, (1991) Techniques of Food Analysis. Allied Scientific Publishers.
6. Rahman M S, (2007) Handbook of Food Preservation 2nd Edition by Taylor & Francis Group, CRC Press.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization C- FOOD SCIENCE
Course Code- CC-10
ADVANCE FOOD SCIENCE
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course is designed to impart both basic and advanced knowledge of food processing and technology, with a focus on the composition, structure, and behavior of food components. It provides a scientific understanding of the physico-chemical, nutritional, and sensory properties of food. Special emphasis is laid on the processing and preservation techniques of cereal and meat-based products. The course also focuses on the optimization of process parameters to ensure quality and consistency in processed foods, equipping students with the skills needed for quality control and innovation in the food industry.

Course Code: CC-10	**Course Title: ADVANCE FOOD SCIENCE**

Course Objective:

- To impart systematic knowledge of basic and applied aspects in food processing and technology
- To enable the student to understand food composition and its physico-chemical, nutritional and sensory aspects.
- To gain in depth knowledge about processing and preservation techniques of cereal and cereal products and meat and meat products.
- To optimize process parameter for consistent quality processed food products.

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

1. Demonstrate an understanding of basic and applied concepts in food processing and technology.Explain key principles and their relevance in industrial food production.
2. Analyze the composition and physico-chemical, nutritional, and sensory attributes of various food products.Evaluate food quality through scientific assessment of its components.
3. Apply scientific knowledge to the processing and preservation of cereals and cereal-based products.Understand and implement traditional and modern techniques for quality maintenance.
4. Describe processing methods for meat and meat products and ensure safety and nutritional retention.Identify critical parameters affecting quality and shelf life in meat processing.
5. Optimize food processing parameters for producing consistent and high-quality food products.Utilize standard protocols and quality indicators to improve process outcomes.

Credits: 3+1	**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	Topic	No. of Lectures
I	**CEREAL, PULSE AND CEREAL PRODUCT TECHNOLOGY** **Cereals:** Wheat, rice, maize, barely, oat; Structure, cultivation, harvesting, properties, composition and commercial value. **Milling process:** Complete milling process,	10

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	rolls, reduction rolls, milled products and nutritive value and applications. **Baking technology:** Bread, biscuits/ Cookies and cake, Principles of baking, Ingredients and their functions, methods of preparation, in- process control, faults, causes and remedies, methods of leavening: physical, biological and chemical, scoring of quality parameters. **Pulses and legumes:** Composition, nutritive value, properties, anti-nutritional factors, cooking quality	
II	**MEAT, FISH, POULTRY, EGG AND ITS PRODUCTS TECHNOLOGY** **Meat:** Composition, variety, slaughtering and related practices, preslaughter handling, grading, ageing, curing, smoking and tenderizing of meat, meat pigments and colour changes, cooking, storage, methods of preservation for value addition and spoilage. **Poultry:** Production considerations, Processing plant operations (slaughter and bleeding, scalding, defeathering, eviscerating, chilling and packaging), cooking, tenderness, flavour and colour changes. **Eggs:** Composition, quality factors, storage, bacterial infection and pasteurization, freezing, drying and egg substitutes. **Fish:** Composition, onboard handling & preservation, drying and dehydration, salt curing, smoking, marinades, fermented products, canning, Modified Atmosphere Packaging, and quality factors.	**10**
III	**MILK AND MILK PRODUCTS TECHNOLOGY** **Milk:** compostion, factors affecting milk quality physical and chemical properties. **Milk processing:** Separation, centrifugal process, natural creaming, pasteurization, sterilization, homogenization, effect of processing on nutritive value. **Milk products:** Khoa, Chnna, butter, butter oil, margarine, cheese, ice cream- Commercial processing, BIS Standards, packaging and distribution **Quality testing:** Platform tests, tests for adulterants, and quality testing of milk products.	**10**
IV	**FRUITS AND VEGETABLE TECHNOLOGY** Structure and composition of different fruits and vegetables in relation to processing Principles of fruits and vegetables preservation Processing technologies: Freezing, dehydration/ during, canning, preserves: jam,	**10**

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	marmalade, pickel, sauce, squash, chatni. Processing and preservation for small scale industry ,FPO 1955	
V	**BEVERAGES** Carbonated and non carbonated drinks, beer, coffee, tea, cocoa	5
		45
Practical:	**Quality testing of different flour:** Gluten quality and quantity, moisture and ash percent, Water Absorption Power (WAP), Pekar color test, Maltose value, Falling Number, Dough Raising Capacity. **Bread Processing:** Straight dough method , sponge & dough method (delayed salt method) and potassium bromate response of different flours, optimisation of brown bread process, preparation of sweet buns/pizza base and process optimisation. **Biscuit and cake:** Short and hard dough biscuits, packaging and shelf life studies. Sponge and cream cakes, packaging and shelf life studies. Milk and milk products technology Chemical analysis of milk and determination of its components like fat, SNF, protein, TSS. Detection of preservatives in milk (boric acid and borate). Detection of adulterants in milk. Analysis of cheese, paneer, khoa as per BIS standards. Tests to judge the efficiency of pasteurization and homogenization. Fruits and Vegetable technology Analysis of Proximate principles: Carbohydrates, sugars, ash, moisture, fat and protein. Experiment on control of enzyme activity, enzyme inactivation in fruits and vegetables. Estimation of acidity, total solids of different foods – Squashes, syrups and juices. Dehydration of fruits and vegetables and shelf life studies: its effect on colour, texture and flavour. Rehydration ratio, rehydration coefficient. Preservation of fruits and vegetables using low temperature. Preservation of fruits and vegetables using Heat, and sugar and estimation of effect of processing nutrients and color: Processing of tomato products. Processing of jams, jellies and marmalades. Processing of pickles **SDG 2: Zero Hunger:**	30

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	Donation Food Drive - Collection of non-perishable food items (aata, rice, dal, sugar, oil) and donating to nearby slum community	

Suggested Readings:

1. Fabriani, G and Lintas C. (1988) Durum Wheat Chemistry and Technology. American Association of Cereal Chemistry Inc.
2. Kent N L.(1993) Technology of Cereals. 4th Edi. Pergamon Press.
3. Olson, V M; Shemwell G A and Pasch, S (1998) Egg and Poultry Meat Processing, VCH P, New York
4. Winton & Winton, (1991) Techniques of Food Analysis. Allied Scientific Publishers.
5. Matz A Samuel, Bakery Technology and Engineering.
6. PomeranzYeshuraj, Food Analysis: Theory and Practice.

M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization C- FOOD SCIENCE
Course Code- DEC-3
FOOD SAFETY AND QUALITY CONTROL
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**
Course Description: This course is designed to impart both basic and advanced knowledge of food processing and technology, with a focus on the composition, structure, and behavior of food components. It provides a scientific understanding of the physico-chemical, nutritional, and sensory properties of food. Special emphasis is laid on the processing and preservation techniques of cereal and meat-based products. The course also focuses on the optimization of process parameters to ensure quality and consistency in processed foods, equipping students with the skills needed for quality control and innovation in the food industry.		
Course Code: DEC-3	**Course Title: FOOD SAFETY AND QUALITY CONTROL**	
Course Objective: This course will enable students to: • Know the importance of quality assurance in food industry. • Know the various test and standards for quality assessment and food safety.		
Course Outcomes: After successful completion of the course, students will be able to: **1.** Demonstrate an understanding of basic and applied concepts in food processing and technology.Explain key principles and their relevance in industrial food production. **2.** Analyze the composition and physico-chemical, nutritional, and sensory attributes of various food products.Evaluate food quality through scientific assessment of its components. **3.** Apply scientific knowledge to the processing and preservation of cereals and cereal-based products.Understand and implement traditional and modern techniques for quality maintenance. **4.** Describe processing methods for meat and meat products and ensure safety and nutritional retention.Identify critical parameters affecting quality and shelf life in meat processing. **5.** Optimize food processing parameters for producing consistent and high-quality food products.Utilize standard protocols and quality indicators to improve process outcomes.		
Credits: 3+1		**Course Type- Elective Course**

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Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	Topic	No. of Lectures
I	**INTRODUCTION TO FOOD SAFETY** Definition, Types of hazards: biological, chemical, physical hazards. Definition Food Safety Issues, Factors affecting food safety, Importance of safe foods.	5
II	**FOOD SAFETY MANAGEMENT TOOLS: BASIC CONCEPT** Shelf life of food products: factors affecting shelf life and methods to check the shelf life. Food additives and contaminants- meaning & various kinds of additives. Recent concerns on food quality-genetically modified foods	15
III	**FOOD SAFTY & QUALITY MANAGEMENT SYSTE** General Principle of food safety risk management. Hazard Analysis Critical Control Point system (HACCP) Quality Management System. TQM-concept & need for quality, components of TQM.	10
IV	**FOOD PACKAGING** Need, Materials used & labeling	5
V	**ANALYTICAL TECHNIQUES IN MICROBIOLOGY** 1. An Introduction to Risk Analysis 2. Risk Management 3. Risk Assessment 4. Risk Communication 5. HACCP-Structure, Principles 6. Other food safety practices	10
		45
Practical:	Assessment of purity and quality using appropriate standar tests for the following: • Water including mineral water • Milk and milk products • Fats and oils (butter and ghee) • Cereals and cereals products • Pulses and legumes • Spices and condiments • Tea and coffee • Confectionary • Fruits juices, concentrates and beverages Detection/ Estimation of Food additives and contaminants **SDG 2: Zero Hunger:**	30

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	Community Kitchens - Set up kitchen to provide regular meals to the homeless or underprivileged.	

Suggested Readings:

1. Early, R. (1995): Guide to quality Management System for the Food Industry.Blackie, academic and Professional, London.
2. Gould, W.A. and Gould R.W. (1988): total Quality Assurance for the Food Industries, CTI Publications Inc. Baltimore.
3. Pomeranz, Y. and Meloan, C.E. (1996): Food Analysis: Theory and practice, CBS Publishers and Distributors, New Delhi.
4. Askar, A and Treptow, H. (1993): Quality Assurance in Tropical Fruit Processing, Springer-Verrtag, Berlin.
5. World Health organization (1998): Guidelines for Drinking Water Quality, 2nd edition, vols 1, 2, and 3, Geneva.

M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization C- FOOD SCIENCE
Course Code- DEC-4
ADVANCE FOOD SCIENCE II
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**
Course Description: This course provides an in-depth understanding of the principles and practices involved in food preservation and the use of food additives. It emphasizes the scientific basis of preserving food quality and extending shelf life while ensuring safety. The course also covers the impact of storage conditions, as well as pre- and post-processing operations, on the nutritional, sensory, and microbiological quality of food. Students will gain knowledge about factors influencing food deterioration and techniques to minimize losses throughout the food supply chain.		
Course Code: DEC-4	**Course Title: ADVANCE FOOD SCIENCE II**	
Course Objective: This course will prepare the students to: • Understand the role of food preservation and food additives • Understand the effect of storage and pre & post processing operations		
Course Outcomes: Upon successful completion of this course, students will be able to: **1.** Explain the significance and principles of food preservation.Identify suitable preservation methods for different food types to maintain quality and shelf life. **2.** Understand the role, types, and safety aspects of food additives.Analyze the functional use of additives in processed foods and interpret food labeling regulations. **3.** Evaluate the impact of storage conditions on food quality and safety.Understand temperature, humidity, and atmospheric influences on the deterioration or preservation of foods. **4.** Assess the effects of pre- and post-processing operations on food characteristics.Examine how cleaning, blanching, packaging, and other operations influence final product quality. **5.** Recommend appropriate preservation and storage strategies for various food products.Apply knowledge to optimize shelf life and reduce post-harvest and post-processing losses.		
Credits: 3+1		**Course Type- Elective Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)		**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

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Total No. of Lectures: Theory (45) +Practical (30)		
Units	**Topic**	**No. of Lectures**
I	**FOOD PRESERVATION** a) Principles Of Food Preservation: Asepsis, Removal Of Microorganism, Anaerobic condition b) Preservation methods and processes: Preservation by chilling and freezing and its types	**15**
II	**FOOD ADDITIVES** a) Functions of food additives b) Preservatives c) Anti-oxidants d) Stabilizers and thickeners e) Fortifying agents f) Anti-caking agents g) Special dietary sweeteners h) Nutrients supplements i) Bleaching and maturing agents j) Leavening agents k) Colouring agents l) Flavoring agents	**15**
III	**FOOD FACTORY OPERATIONS** a) Pre- processing operations b) Post processing operations	**10**
IV	**FOOD LAWS AND STANDARDS** FASSI, ICMSF, HACCP, CODEX, WTO, ISO	**5**
		45
Practical:	To communicate with villagers about various food safety measures available to them and their benefits. **SDG 2: Zero Hunger:** Donation Food Drive - Collection of non-perishable food items (aata, rice, dal, sugar, oil) and donating to nearby slum community.	**30**

Suggested Readings:

- *Food facts and principles*, N. ShakuntalaManay and M. Shadaksharaswamy, Edition III, New Age International Publishers, Delhi, India, 2008.
- *Food Science*, B. Srilakshmi, Edition VI, New Age International Publishers, Delhi, India, 2018.
- *Food microbiology*, William C. Frazier and Dennis C. Westhoff, Edition V, Tata Mcgraw Hill Education, 2013
- *Food Science and Nutrition,* SunetraRoday, Edition II, Oxford publishers, 2012

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization C- FOOD SCIENCE
Course Code- DEC-5
CURRENT TRENDS & ISSUES IN FOOD & NUTRITION
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course offers an in-depth exploration of current and emerging topics in the fields of nutrition, food science, and public health. It encompasses the study of horticulture and olericulture, genetically modified foods, nutraceuticals, and functional foods, while also examining contemporary trends in food processing such as fermentation, probiotics, and food fortification. Special focus is placed on the nutritional management of lifestyle diseases and the role of trace minerals in health. The course also integrates recent developments in public nutrition programs and policies, along with student-led seminars to promote research, critical thinking, and communication skills.

Course Code: DEC-5	**Course Title: CURRENT TRENDS & ISSUES IN FOOD & NUTRITION**

Course Objective: By the end of this course, students will be able to:

- Understand the significance of horticulture, olericulture, and genetically modified foods in modern nutrition.
- Define and classify nutraceuticals, nutri-genomics, and functional foods and evaluate their role in disease prevention.
- Examine new trends in food processing, including the use of fermented products, probiotics, and food fortification techniques.
- Analyze the nutritional and dietary implications of lifestyle diseases and trace element deficiencies.
- Critically evaluate national strategies and recent initiatives in public nutrition and education.
- Develop research and presentation skills through seminar participation.

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

- Explain the advantages and disadvantages of genetically modified foods and their impact on health and agriculture.
- Demonstrate an understanding of nutraceuticals, nutri-genomics, and functional foods in the context of personalized nutrition.
- Identify and describe fermented foods, probiotics, prebiotics, single cell proteins, and their benefits in the food industry.
- Assess the importance of micronutrients like zinc and manganese and understand disorders like PICA and celiac disease from a nutritional perspective.
- Evaluate current public nutrition strategies and discuss recent advancements in nutrition education programs.
- Present and discuss current issues and trends in food and nutrition through seminars, showcasing critical analysis and communication skills.

Credits: 3+1	**Course Type- Elective Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)
Total No. of Lectures: Theory (45) +Practical (30)	

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Units	Topic	No. of Lectures
I	**HORTICULTURE AND OLERICULTURE** • Genetically modified foods- advantages and disadvantages • Nutraceuticals, Nutri-genomics And Nutri-genetics- definition, classification, importance • Functional foods • Antioxidants and pigments	10
II	**TRENDS IN FOOD PROCESSING INDUSTRY** • Fermented foods- importance, benefits and examples • Pro-biotics and pre-biotics, single cell protein • Food fortification, enrichment, supplementation, medical foods	10
III	**LIFESTYLE DISAESES** • Role of zinc and manganese in health • PICA and Celiac Disease- causes, prevention and diet	10
IV	**RECENT DEVELOPMENTS IN PUBLIC NUTRITION** • Current strategies and programmes to combat public nutrition • Recent advances in nutrition education programme	15
		45
Practical:	3- Seminar on current trends and issues in food and nutrition **SDG 14: Life Below Water:** Raise awareness on the harmful effects of detergents and chemicals.	30

Suggested Readings:
1. Jwels of foods and nutrition, Dr. R. V. Raval, Department of Home Science, Saurashtra University, Rajkot.
2. WHO – Technical report series.
3. Garrow, J.S. James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietitics, 10th Edition, Churohill Livingstone.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization C- FOOD SCIENCE
Course Code- OEC
DISSERTATION
(2 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course is designed to equip students with the foundational knowledge and practical skills required for preparing a research synopsis. It emphasizes the critical steps involved in initiating a research project—ranging from topic selection to hypothesis formulation, sampling design, development of research tools, and standardization of procedures. Students will also gain competence in applying statistical methods for data analysis and citing sources using APA (7th edition) referencing style. The course culminates in the structured presentation of the research synopsis, thereby enhancing students' academic writing and presentation skills.

Course Code: OEC	**Course Title: DISSERTATION**

Course Objective: By the end of this course, students will be able to:

- Understand the process of selecting a meaningful and researchable topic.
- Formulate clear and achievable research objectives and hypotheses.
- Design appropriate research methodologies and sampling strategies.
- Develop and validate effective tools for data collection.
- Apply standardization techniques and ethical practices in data collection.
- Perform basic statistical analysis for interpreting research data.
- Use correct APA 7th edition referencing and citation format.
- Present a comprehensive and well-structured research synopsis.

Course Outcomes: Upon successful completion of the course, students will be able to:

- Select and define a relevant research problem with academic and societal significance.
- Frame specific objectives and hypotheses aligned with the research topic.
- Design a suitable research methodology including sampling technique and sample size determination.
- Construct or select appropriate tools such as questionnaires, interview schedules, and rating scales for data collection.
- Standardize research tools and procedures to ensure reliability and validity.
- Apply relevant statistical techniques for data analysis and interpretation.
- Accurately cite sources and prepare a reference list using APA 6th edition style.
- Effectively communicate their research plan through a formal synopsis presentation.

Credits: 1+1	**Course Type- Open Elective**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (15) +Practical (30)

Units	**Topic**	**No. of Lectures**
I	Preparation of the synopsis in context of the following points- • Selection of the research topic • Objectives • Research Design	**15**

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	• Formulation of Hypothesis • Sampling design and size • Selection/ Development of tools for data collection, e.g. Questionnaire, Interview Schedule, Observation, Rating Scale etc. • Standardization of procedures (as per requirement) • Statistical Analysis • References and Citations (APA Style, 6th Edition) • Presentation	
		15
Practical:	3- Presentation of Synopsis and viva based on synopsis	**30**

Suggested Readings:

Kothari, C. R., & Garg, G. (2019). *Research Methodology: Methods and Techniques* (4th ed.). New Age International Publishers.
→ Comprehensive guide covering research design, hypothesis, sampling, and statistical analysis.
Kumar, R. (2019). *Research Methodology: A Step-by-Step Guide for Beginners* (5th ed.). SAGE Publications.
→ Beginner-friendly book for selecting a topic, setting objectives, and data collection tools.
Best, J. W., & Kahn, J. V. (2016). *Research in Education* (10th ed.). Pearson.
→ Especially useful for understanding educational and social science research methodology.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization D- *SPORTS NUTRITION*
Course Code- CC-9
CLINICAL SPORTS NUTRITION
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course offers a comprehensive overview of nutrition-related disorders commonly observed in athletes and explores the role of Medical Nutrition Therapy (MNT) in their management. It integrates principles of exercise physiology with clinical nutrition to assess the effects of various health conditions on athletic performance. The course emphasizes evidence-based dietary interventions tailored to enhance recovery, optimize performance, and maintain overall health in athletic populations.

Course Code: CC-9	**Course Title: CLINICAL SPORTS NUTRITION**

Course Objective: This course aims to provide students with an in-depth understanding of nutrition-related disorders in athletes and the role of medical nutrition therapy (MNT) in their management. It covers the impact of various conditions on performance, exercise physiology, and appropriate dietary interventions for optimizing health and athletic performance.

Course Outcomes: Upon successful completion of this course, students will be able to:

1. Identify common nutrition-related disorders affecting athletes.Recognize conditions such as Relative Energy Deficiency in Sport (RED-S), gastrointestinal issues, micronutrient deficiencies, and eating disorders.
2. Understand the principles and applications of Medical Nutrition Therapy (MNT) in sports nutrition.Design personalized nutrition care plans for athletes with specific health concerns.
3. Evaluate the physiological and metabolic effects of exercise and medical conditions on athletic performance.Correlate exercise physiology with nutritional needs during training and competition.
4. Recommend evidence-based dietary interventions for managing disorders and enhancing performance.Formulate nutrition strategies for hydration, recovery, endurance, and strength optimization.
5. Integrate clinical and sports nutrition approaches for injury prevention and rehabilitation in athletes.Apply MNT principles to support immune health, reduce inflammation, and facilitate healing.

Credits: 3+1	**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	**Topic**	**No. of Lectures**
I	Diabetes & Cardiovascular Disease in Athletes Overview & Physiological Effects o Definition and description of Diabetes Mellitus and Cardiovascular Diseases o Physiological effects of exercise on blood glucose regulation and heart health Challenges & Exercise Considerations o High-risk sports and insulin abuse o Exercise considerations for	**15**

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	Hyperinsulinemia &Hypoinsulinemia o Managing acute and long-term effects of exercise training on insulin sensitivity Medical Nutrition Therapy (MNT) & Dietary Strategies o Nutrient timing and carbohydrate management for blood sugar control o Pre- & post-event carbohydrate loading & fluid intake o Insulin adjustments and complications of poorly controlled diabetes	
II	Bone & Blood Health in Athletes Osteoporosis in Athletes o Causes and consequences of bone mineral loss in athletes o Physiological effects of exercise on bone health o Medical Nutrition Therapy (MNT) for osteoporosis prevention and management Sports Anaemia in Athletes o Definition, causes, and impact of exercise on blood health o Pathophysiology and risk factors for sports anaemia o MNT for managing iron status and preventing anaemia	**15**
III	Gastrointestinal Disorders, Food Allergies & Intolerances in Athletes 1. Gastrointestinal (GI) Issues in Athletes o Common GI disturbances (bloating, diarrhoea, constipation) before, during & after training o Physiological and dietary factors affecting gastric emptying and gut comfort o Gut trainability and lower GI tract conditions 2. Food-Related Adverse Reactions (FRAR) in Athletes o Differentiating food allergies vs. food intolerances o Diagnosis &Medical Nutrition Therapy (MNT) for FRAR o Nutritional recommendations for athletes with food allergies & intolerances 3. Irritable Bowel Syndrome (IBS) & Low-FODMAP Diet o Dietary strategies for managing IBS in athletes o Composition, food sources, and patterns of FODMAP consumption 4. Celiac Disease & Inflammatory Bowel Disease (IBD) in Athletes o Diagnosis & treatment considerations	**15**

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	○ Nutritional concerns and medical nutrition therapy (MNT) for athletes with IBD	
		45
Practical:	**Diet Planning for Athletes with Medical Conditions** • Diabetes & Cardiovascular Disease • Sports Anemia& Osteoporosis • Food-related allergies & intolerances • Sports injuries and recovery nutrition • Paralympic athletes & Vegetarian athletes **Sports-Specific Nutritional Planning** • Football, Hockey, Cricket, Sprinters, Marathon Runners, Badminton Players • Rowing & Power Sports (Including Weight Management) • Gymnastics & Archery (Including Weight Management Considerations) **SDG 3: Good Health and Well-Being:** Set up a mobile health camp (dental, eye, breast cancer, seasonal diseases) in collaboration with local clinics.	**30**

Suggested Readings:

Dunford, M., & Doyle, J. A. (2019). *Nutrition for Sport and Exercise* (4th ed.). Cengage Learning.
Manore, M. M., Thompson, J. L., & Collene, A. L. (2016). *Sport Nutrition for Health and Performance* (3rd ed.). Human Kinetics.
Rosenbloom, C. (2016). *Sports Nutrition: A Handbook for Professionals* (6th ed.). Academy of Nutrition and Dietetics.
Colberg, S. R. (2012). *Exercise and Diabetes: A Clinician's Guide to Prescribing Physical Activity*. American Diabetes Association.
Jeukendrup, A. E., & Gleeson, M. (2018). *Sport Nutrition: An Introduction to Energy Production and Performance* (3rd ed.). Human Kinetics.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization D- *SPORTS NUTRITION*
Course Code- CC-10
NUTRITION FOR SPECIAL GROUPS AND SPORTS INJURIES
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course offers an in-depth exploration of the unique nutritional needs of athletes with special physiological, environmental, and lifestyle considerations. It covers the dietary requirements of Paralympic athletes, children, adolescents, female athletes, and vegetarians engaged in competitive sports. The course also addresses the effects of environmental extremes such as altitude, cold, and heat on performance and metabolism. Special emphasis is placed on the role of nutrition in injury rehabilitation and in managing the challenges faced by athletes during travel and competition. Students will gain evidence-based knowledge to develop and implement appropriate nutrition strategies tailored to these diverse athletic populations.

Course Code: CC-10	**Course Title: NUTRITION FOR SPECIAL GROUPS AND SPORTS INJURIES**

Course Objective: This course provides an in-depth understanding of the nutritional needs of athletes with special conditions, including Paralympic athletes, children, adolescents, female athletes, and vegetarians. It also covers the impact of altitude, cold, and heat on performance, injury rehabilitation, and the nutritional challenges faced by travelling athletes.

Course Outcomes: Upon successful completion of this course, students will be able to:

1. Understand the specific nutritional requirements of special athletic populations.
2. Evaluate the physiological and metabolic challenges posed by extreme environmental conditions.
3. Apply nutrition principles in the context of injury prevention and rehabilitation.
4. Formulate nutrition strategies for athletes during travel and competition.
5. Design comprehensive nutrition care plans tailored to special conditions in sport.

Credits: 3+1	**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	**Topic**	**No. of Lectures**
I	Nutrition for Paralympic Athletes 1. Athletes with Physical or Intellectual Impairments o Classification systems & associated health risks o Body composition assessment & management o Eating difficulties & behaviours in impaired athletes 2. Nutritional Demands & Challenges o Common dietary intakes & potential nutritional issues o Fibre, bowel control, & meal timing	**10**

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	strategies o Hydration needs & fluid management o Therapeutic Use Exemption (TUE) under WADA for medications o Use of vitamins, minerals, & sports supplements o Nutrition strategies for travelling with Paralympic athletes	
II	Sports Injuries, Rehabilitation, & Recovery Nutrition 1. Common Sports Injuries & Rehabilitation Needs o Types of injuries: Maxillofacial fractures, ACL tears, knee injuries, tennis elbow, ankle sprains, groin pulls, hamstring strains o Physiological & metabolic changes during injury & rehabilitation o Impact of injuries on body weight & eating habits 2. Nutrition Strategies for Injury Recovery o Role of macronutrients & micronutrients in healing o Dietary guidelines for inflammation control & muscle repair o Preventing excessive weight gain in injured athletes	**10**
III	Nutrition for Athletes with Special Dietary Needs 1. Children & Adolescent Athletes o Growth & development considerations o Nutritional issues: Eating habits, addiction risks, energy demands o Macronutrient & micronutrient requirements 2. Female Athletes & the Female Athlete Triad (FAT) o Nutritional vulnerabilities & energy balance o Components of FAT (Eating disorders, menstrual irregularities, & bone density issues) o Assessment & dietary guidelines for FAT prevention 3. Vegetarian Athletes o Classification of vegetarian diets o Identified nutritional gaps& deficiencies o Dietary modifications for training, competition & travel	**12**
IV	Environmental Challenges & Travelling Athlete Nutrition 1. Altitude, Cold, & Heat Training Nutrition o Physiological adaptations to altitude training o Dietary recommendations for high-altitude performance o Nutrition in cold environments: Special hydration & meal planning o Effects of heat exposure on performance, hydration, & electrolyte balance	**13**

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	○ Strategies for preventing heat stress & injuries 2. Nutrition & Travel Challenges for Athletes ○ Common nutritional concerns during travel ○ Adjustments for climate, altitude, and time zones ○ Hydration & supplement strategies for domestic & international travel ○ Preventing jet lag, foodborne illnesses, diarrhea, & vomiting ○ Emergency nutrition & hydration plans for traveling athletes	
		45
Practical:	1. Eating Attitudes Test (EAT): Assessing eating disorders in athletes 2. Menu Planning & Fluid Strategies for athletes training in different altitudes & climates 3. Travel Nutrition Planning: Hydration, overcoming jet lag, & preventing foodborne illnesses 4. Customized Meal Planning for injured athletes & special dietary groups **SDG 1: No Poverty:** Collect and distribute essential kits (food, clothes, hygiene) to needy families.	**30**

Suggested Readings:

Dunford, M., & Doyle, J. A. (2019). *Nutrition for Sport and Exercise* (4th ed.). Cengage Learning.

Manore, M. M., Thompson, J. L., & Collene, A. L. (2016). *Sport Nutrition for Health and Performance* (3rd ed.). Human Kinetics.

Mountjoy, M., & Budgett, R. (Eds.). (2018).*Handbook of Sports Medicine and Science: The Paralympic Athlete* (IOC Medical Commission). Wiley-Blackwell.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization D- *SPORTS NUTRITION*
Course Code- DEC-3
DIETARY SUPPLEMENTS & ERGOGENIC AIDS
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**
Course Description: This course provides an in-depth exploration of the classification, regulation, and application of nutritional supplements and ergogenic aids in athletic performance. It examines both scientific evidence and legal frameworks concerning the use, efficacy, and safety of supplements in sports. Topics include the physiological effects of various ergogenic aids, supplement safety and quality assurance, anti-doping regulations, and the psychosocial and behavioural factors influencing supplement use among athletes. The course prepares students to critically evaluate supplement claims and make evidence-based recommendations within the scope of ethical and legal guidelines.		
Course Code: DEC-3	**Course Title: DIETARY SUPPLEMENTS & ERGOGENIC AIDS**	
Course Objective: This course explores the role, classification, regulation, and application of nutritional supplements and ergogenic aids in sports. It covers scientific, legal, and practical aspects, including doping control, supplement safety, and the behavioural influences on supplement use.		
Course Outcomes: Upon successful completion of this course, students will be able to: 1. Understand the classification and physiological roles of nutritional supplements and ergogenic aids. 2. Evaluate the scientific evidence behind commonly used supplements in sports. 3. Apply knowledge of regulatory and legal frameworks to supplement use in athletes. 4. Identify and assess risks related to supplement contamination, safety, and doping. 5. Analyze behavioural, cultural, and psychological factors influencing supplement use in athletes. 6. Formulate evidence-based supplement strategies aligned with health, performance, and ethical standards.		
Credits: 3+1		**Course Type- Elective Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)		**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)
Total No. of Lectures: Theory (45) +Practical (30)		

Units	**Topic**	**No. of Lectures**
I	Introduction to Nutritional Supplements & Ergogenic Aids • Evolution of Supplements in Sports – From basic nutrition to performance-enhancing aids. • Definitions & Classifications – Dietary supplements vs. ergogenic aids (nutritional, physiological, mechanical, pharmacological). • Regulatory Framework & Safety – FDA, DSHEA 1994, WADA, NADA, and FSSAI regulations. • Risks & Contaminants – Banned substances, supplement adulteration, and consumer protection.	**15**
II	Doping Control & Supplement Testing • Anti-Doping Organizations – WADA, NADA,	**15**

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	their history, and doping regulations. • Prohibited Substances & Drug Testing – List of banned drugs, analytical procedures, and testing in athletes. • Supplement Safety & Compliance – Government actions on high-risk supplements (Ephedra, DMAA, Androstenedione).	
III	Role of Supplements in Sports Performance • Effectiveness & Risks – Benefits of supplements for endurance, strength, and recovery; risks of mega-dosing. • Psychological &Behavioral Aspects – Motivational factors driving supplement use in athletes. • General vs. Sport-Specific Benefits – Supplements tailored for different types of sports and exercise.	**15**
		45
Practical:	1. Macronutrient Supplements Proteins – Whey, Casein, Egg, Soy, Pea, Vegan blends, Protein bars & shakes. Carbohydrates – Carb loading, Sports drinks, Gels, Energy bars. Fats – Omega-3, MCTs, Fish Oils. 2. Micronutrient & Antioxidant Supplements Vitamins & Minerals – B-complex, C, D, E, Calcium, Iron, Zinc, Chromium. Antioxidants – Vitamin-based & mineral-based supplements. 3. Ergogenic Aids Botanical Aids – Beetroot, Green Tea Extract, Caffeine, Ashwagandha, Ginseng, Phytosterols, Garcinia Cambogia. Metabolite Aids – Beta-Alanine, L-Carnitine, Coenzyme Q10, Creatine, DHEA, HMB. **SDG 17: Partnerships for the Goals:** Collaborate with NGOs for joint awareness campaigns. Invite local leaders for interactive sessions with students	**30**

Suggested Readings:

Phillips, S. M., & Van Loon, L. J. (2011). *Dietary Protein for Athletes: From Requirements to Metabolic Advantage. Applied Physiology, Nutrition, and Metabolism*, 36(5), 647–654.

Antonio, J., & Kreider, R. B. (Eds.). (2019). *Protein and Exercise: The Building Blocks for Recovery and Per***Volpe, S. L. (2021).** *Micronutrients in Health and Disease*. CRC Press.*formance*. Nova Science Publishers.

 international Society of Sports Nutrition (ISSN) – www.sportsnutritionsociety.org
Position stands on creatine, caffeine, omega-3s, protein, etc.

 WADA (World Anti-Doping Agency) – www.wada-ama.org
– For regulation of ergogenic aids and banned supplements.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization D- *SPORTS NUTRITION*
Course Code- DEC-4
ADVANCED TECHNIQUES IN NUTRITIONAL ASSESSMENT FOR ATHLETES
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course provides an in-depth understanding of the principles, tools, and techniques used to assess the nutritional status and overall health of athletes. Emphasizing both theoretical knowledge and hands-on skills, the course covers the evaluation of dietary intake, body composition, hydration status, and metabolic health. Students will explore a variety of assessment methods including anthropometric measurements, biochemical analyses, dietary surveys, and performance indicators. Through practical sessions, students will learn to interpret data and use it to support evidence-based nutrition planning and performance optimization in athletes.

Course Code: DEC-4	**Course Title: ADVANCED TECHNIQUES IN NUTRITIONAL ASSESSMENT FOR ATHLETES**

Course Objective: This course aims to provide an in-depth understanding of the various tools, equipment, and methods used to assess the nutritional status, body composition, hydration, and metabolic health of sportspersons. Students will learn both theoretical and practical aspects of assessing an athlete's dietary intake, biochemical markers, and physical status.

Course Outcomes: Upon successful completion of this course, students will be able to:

1. Understand the key components and importance of nutritional assessment in athletes.
2. Apply various tools and techniques for evaluating body composition and hydration status.
3. Analyze dietary intake using food records, recalls, and dietary software tools.
4. Interpret biochemical and clinical markers related to metabolic health and performance.
5. Design athlete-specific nutritional assessment plans for performance monitoring and nutrition counselling.

Credits: 3+1	**Course Type- Elective Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	**Topic**	**No. of Lectures**
I	Introduction to Nutritional Assessment in Sports 1. Concept & Importance of Nutritional Assessment in Sports o Role of nutritional assessment in performance enhancement o Impact of poor nutrition on endurance, strength, and recovery 2. Methods of Nutritional Assessment o Direct vs. Indirect Assessment Methods o Four Major Categories of Nutritional Assessment: ▪ Anthropometric Measurements	**15**

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	▪ Biochemical Analysis ▪ Clinical Evaluation ▪ Dietary Assessment 3. Introduction to Nutritional Assessment Equipment & Technologies o Overview of traditional and modern technologies in sports nutrition assessment	
II	Anthropometric & Body Composition Assessment 1. Anthropometric Measurements o Height, Weight, BMI Calculation o Skinfold Thickness Measurement (Using Calipers) o Girth Measurements (Waist, Hip, Limb Circumference) 2. Body Composition Analysis Methods o Bioelectrical Impedance Analysis (BIA): Principles, applications, and limitations o Dual-Energy X-ray Absorptiometry (DEXA): Uses in sports and research o Air Displacement Plethysmography (Bod Pod): Accuracy and usage o Hydrostatic Weighing: Gold standard for body fat assessment o 3D Body Scanners & Infrared Imaging: Emerging technologies 3. Application of Body Composition Data in Sports Nutrition o Using body composition data for personalized diet and training plans	**15**
III	Biochemical & Hydration Status Assessment 1. Biochemical Markers for Nutritional Status o Blood Tests for Macronutrient & Micronutrient Levels ▪ Protein status (Albumin, Prealbumin) ▪ Iron status (Serum Ferritin, Hemoglobin) ▪ Vitamin & Mineral Levels (Vitamin D, B12, Magnesium, Zinc) o Hormonal Assessments Related to Performance ▪ Cortisol & Testosterone ▪ Thyroid function (TSH, T3, T4) 2. Hydration Status Assessment o Urine-Specific Gravity (USG) & Urine Color Test o Plasma Osmolality & Electrolyte Analysis o Sweat Analysis for Electrolyte Loss in Athletes o Total Body Water (TBW) Measurement Using BIA	**15**

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	3. Advanced Biomarkers for Sports Nutrition o Metabolic Markers (Blood Lactate, Glucose Monitoring, VO□ Max Testing) o Oxidative Stress & Inflammation Markers in Athletes	
		45
Practical:	Dietary Assessment Methods & Emerging Technologies 1. Dietary Intake Assessment Methods o 24-Hour Dietary Recall: Advantages and limitations o Food Frequency Questionnaires (FFQs): Usage in athlete populations o Weighed Food Records & Dietary Logs o Technology-Based Dietary Tracking ▪ Mobile apps (MyFitnessPal, Cronometer) ▪ AI-powered meal tracking 2. Metabolic Rate & Energy Expenditure Measurement o Indirect Calorimetry for Resting Metabolic Rate (RMR) o Doubly Labeled Water (DLW) for Total Energy Expenditure (TEE) o Wearable Technology for Energy Tracking (Garmin, WHOOP, Oura, Fitbit) 3. Emerging Trends in Nutritional Assessment Technologies o Nutrigenomics & Genetic Testing in Sports Nutrition o Microbiome Analysis for Personalized Nutrition o AI & Machine Learning in Predicting Nutritional Needs **SDG 11: Sustainable Cities and Communities:** Set up recycling corners in college or hostels	**30**

Suggested Readings:

Lee, R. D., & Nieman, D. C. (2019). *Nutritional Assessment* (7th ed.). McGraw-Hill Education.
Manore, M. M., & Thompson, J. L. (2017). *Sport Nutrition for Health and Performance* (3rd ed.). Human Kinetics.
Dunford, M., & Doyle, J. A. (2019). *Nutrition for Sport and Exercise* (4th ed.). Cengage Learning.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization D- SPORTS NUTRITION
Course Code- DEC-5
CURRENT TRENDS & ISSUES IN FOOD & NUTRITION
(4 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course offers an in-depth exploration of current and emerging topics in the fields of nutrition, food science, and public health. It encompasses the study of horticulture and olericulture, genetically modified foods, nutraceuticals, and functional foods, while also examining contemporary trends in food processing such as fermentation, probiotics, and food fortification. Special focus is placed on the nutritional management of lifestyle diseases and the role of trace minerals in health. The course also integrates recent developments in public nutrition programs and policies, along with student-led seminars to promote research, critical thinking, and communication skills.

Course Code: DEC-5	**Course Title: CURRENT TRENDS & ISSUES IN FOOD & NUTRITION**

Course Objective: By the end of this course, students will be able to:

- Understand the significance of horticulture, olericulture, and genetically modified foods in modern nutrition.
- Define and classify nutraceuticals, nutri-genomics, and functional foods and evaluate their role in disease prevention.
- Examine new trends in food processing, including the use of fermented products, probiotics, and food fortification techniques.
- Analyze the nutritional and dietary implications of lifestyle diseases and trace element deficiencies.
- Critically evaluate national strategies and recent initiatives in public nutrition and education.
- Develop research and presentation skills through seminar participation.

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

- Explain the advantages and disadvantages of genetically modified foods and their impact on health and agriculture.
- Demonstrate an understanding of nutraceuticals, nutri-genomics, and functional foods in the context of personalized nutrition.
- Identify and describe fermented foods, probiotics, prebiotics, single cell proteins, and their benefits in the food industry.
- Assess the importance of micronutrients like zinc and manganese and understand disorders like PICA and celiac disease from a nutritional perspective.
- Evaluate current public nutrition strategies and discuss recent advancements in nutrition education programs.
- Present and discuss current issues and trends in food and nutrition through seminars, showcasing critical analysis and communication skills.

Credits: 3+1	**Course Type- Elective Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (45) +Practical (30)

Units	**Topic**	**No. of Lectures**

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I	**HORTICULTURE AND OLERICULTURE** • Genetically modified foods- advantages and disadvantages • Nutraceuticals, Nutri-genomics And Nutri-genetics- definition, classification, importance • Functional foods • Antioxidants and pigments	**10**
II	**TRENDS IN FOOD PROCESSING INDUSTRY** • Fermented foods- importance, benefits and examples • Pro-biotics and pre-biotics, single cell protein • Food fortification, enrichment, supplementation, medical foods	**10**
III	**LIFESTYLE DISAESES** • Role of zinc and manganese in health • PICA and Celiac Disease- causes, prevention and diet	**10**
IV	**RECENT DEVELOPMENTS IN PUBLIC NUTRITION** • Current strategies and programmes to combat public nutrition • Recent advances in nutrition education programme	**15**
		45
Practical:	4- Seminar on current trends and issues in food and nutrition	**30**

Suggested Readings:

1. Jwels of foods and nutrition, Dr. R. V. Raval, Department of Home Science, Saurashtra University, Rajkot.
2. WHO – Technical report series.
3. Garrow, J.S. James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietitics, 10th Edition, Churohill Livingstone.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ III SEM
Specialization D- SPORTS NUTRITION
Course Code- OEC
DISSERTATION
(2 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: III**

Course Description: This course is designed to equip students with the foundational knowledge and practical skills required for preparing a research synopsis. It emphasizes the critical steps involved in initiating a research project—ranging from topic selection to hypothesis formulation, sampling design, development of research tools, and standardization of procedures. Students will also gain competence in applying statistical methods for data analysis and citing sources using APA (7th edition) referencing style. The course culminates in the structured presentation of the research synopsis, thereby enhancing students' academic writing and presentation skills.

Course Code: OEC	**Course Title: DISSERTATION**

Course Objective: By the end of this course, students will be able to:

- Understand the process of selecting a meaningful and researchable topic.
- Formulate clear and achievable research objectives and hypotheses.
- Design appropriate research methodologies and sampling strategies.
- Develop and validate effective tools for data collection.
- Apply standardization techniques and ethical practices in data collection.
- Perform basic statistical analysis for interpreting research data.
- Use correct APA 7th edition referencing and citation format.
- Present a comprehensive and well-structured research synopsis.

Course Outcomes: Upon successful completion of the course, students will be able to:

- Select and define a relevant research problem with academic and societal significance.
- Frame specific objectives and hypotheses aligned with the research topic.
- Design a suitable research methodology including sampling technique and sample size determination.
- Construct or select appropriate tools such as questionnaires, interview schedules, and rating scales for data collection.
- Standardize research tools and procedures to ensure reliability and validity.
- Apply relevant statistical techniques for data analysis and interpretation.
- Accurately cite sources and prepare a reference list using APA 6th edition style.
- Effectively communicate their research plan through a formal synopsis presentation.

Credits: 1+1	**Course Type- Open Elective**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (15) +Practical (30)

Units	Topic	No. of Lectures
I	Preparation of the synopsis in context of the following points- • Selection of the research topic • Objectives • Research Design	15

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	• Formulation of Hypothesis • Sampling design and size • Selection/ Development of tools for data collection, e.g. Questionnaire, Interview Schedule, Observation, Rating Scale etc. • Standardization of procedures (as per requirement) • Statistical Analysis • References and Citations (APA Style, 6th Edition) • Presentation	
		15
Practical:	4- Presentation of Synopsis and viva based on synopsis	**30**

Suggested Readings:

Kothari, C. R., & Garg, G. (2019). *Research Methodology: Methods and Techniques* (4th ed.). New Age International Publishers.
→ Comprehensive guide covering research design, hypothesis, sampling, and statistical analysis.
Kumar, R. (2019). *Research Methodology: A Step-by-Step Guide for Beginners* (5th ed.). SAGE Publications.
→ Beginner-friendly book for selecting a topic, setting objectives, and data collection tools.
Best, J. W., & Kahn, J. V. (2016). *Research in Education* (10th ed.). Pearson.
→ Especially useful for understanding educational and social science research methodology.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ IV SEM
Course Code- CC-11
DISSERTATION
(10 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: IV**

Course Description: This course is designed to equip students with the foundational knowledge and practical skills required for preparing a research synopsis. It emphasizes the critical steps involved in initiating a research project—ranging from topic selection to hypothesis formulation, sampling design, development of research tools, and standardization of procedures. Students will also gain competence in applying statistical methods for data analysis and citing sources using APA (7th edition) referencing style. The course culminates in the structured presentation of the research synopsis, thereby enhancing students' academic writing and presentation skills.

Course Code: CC-11	**Course Title: DISSERTATION**

Course Objective: By the end of this course, students will be able to:

- Understand the process of selecting a meaningful and researchable topic.
- Formulate clear and achievable research objectives and hypotheses.
- Design appropriate research methodologies and sampling strategies.
- Develop and validate effective tools for data collection.
- Apply standardization techniques and ethical practices in data collection.
- Perform basic statistical analysis for interpreting research data.
- Use correct APA 7th edition referencing and citation format.
- Present a comprehensive and well-structured research synopsis.

Course Outcomes: Upon successful completion of the course, students will be able to:

- Select and define a relevant research problem with academic and societal significance.
- Frame specific objectives and hypotheses aligned with the research topic.
- Design a suitable research methodology including sampling technique and sample size determination.
- Construct or select appropriate tools such as questionnaires, interview schedules, and rating scales for data collection.
- Standardize research tools and procedures to ensure reliability and validity.
- Apply relevant statistical techniques for data analysis and interpretation.
- Accurately cite sources and prepare a reference list using APA 6th edition style.
- Effectively communicate their research plan through a formal synopsis presentation.

Credits: 10	**Course Type- Open Elective**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Theory (75) +Practical (150)

Units	**Topic**	**No. of Lectures**
I	Preparation of the synopsis in context of the following points- • Selection of the research topic • Objectives • Research Design • Formulation of Hypothesis	75

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	• Sampling design and size • Selection/ Development of tools for data collection, e.g. Questionnaire, Interview Schedule, Observation, Rating Scale etc. • Standardization of procedures (as per requirement) • Statistical Analysis • References and Citations (APA Style, 6th Edition) • Presentation	
Practical:	Presentation of final dissertation and viva based on final dissertation.	**150**

Suggested Readings:

Kothari, C. R., & Garg, G. (2019). *Research Methodology: Methods and Techniques* (4th ed.). New Age International Publishers.
→ Comprehensive guide covering research design, hypothesis, sampling, and statistical analysis.
Kumar, R. (2019). *Research Methodology: A Step-by-Step Guide for Beginners* (5th ed.). SAGE Publications.
→ Beginner-friendly book for selecting a topic, setting objectives, and data collection tools.
Best, J. W., & Kahn, J. V. (2016). *Research in Education* (10th ed.). Pearson.
→ Especially useful for understanding educational and social science research methodology.

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ IV SEM
Course Code- CC-12
INTERNSHIP
(10 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: IV**

Course Description: This course is designed to provide students with an opportunity to apply the theoretical knowledge and conceptual understanding gained during coursework in a real-world or simulated professional environment. It emphasizes hands-on training, practical exposure, and skill refinement in the student's chosen area of specialization. Through experiential learning, students will develop greater proficiency, enhance their analytical and problem-solving skills, and learn to evaluate and improve practices based on situational analysis. The course aims to foster independent thinking, adaptability, and technical competence in diverse practical settings.

Course Code: CC-12	**Course Title: INTERNSHIP**

Course Objective:

- To enable the students to acquire an in-depth understanding of the practical aspects of knowledge and skills acquired during the course work in the relevant subjects.
- To gain hands on experience for higher proficiency in their selected area of expertise.
- To help the students to develop and have their analytical abilities for situation analysis and bringing about improvements.

Course Outcomes: Upon successful completion of this course, students will be able to:

1. Apply theoretical knowledge in practical settings to gain meaningful, hands-on experience in their area of specialization.
2. Demonstrate technical proficiency and professional skills relevant to their chosen field of study.
3. Critically analyze practicalsituationsand use evidence-based approaches to identify gaps and suggest improvements.
4. Develop problem-solving and decision-making skills by engaging in real-life scenarios and practical challenges.
5. Enhance communication, teamwork, and adaptability through structured fieldwork or lab-based experiences.
6. Reflect on personal and professional growth through documentation, feedback, and self-assessment during the course of training.

Credits: 10	**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Practical (300)

Practical:	The student will be required to undergo an internship/field placement for the total duration of 6-8 weeks in their chosen area of interest which will facilitate their pursing a professional career in the same field. This program could be taken up either as a single block or in two different blocks. It is mandatory that the organization/ institution (public/private) participating in the field placement programme be of good professional standing. The list could include hospitals, state run/NGO administered	**300**

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	public nutrition programmes, food industry etc. the students will be required to submit and present a report of the internship/ field placement project after its completion. It is also envisaged that the participating organization/institution will give their performance appraisal of the student work.	

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ IV SEM
Course Code- EEC-2
RESEARCH COMMUNICATION AND SCHOLARLY PUBLISHING
(2 Credits)

Credits: 2 (2+0)
Marks: 50 (Theory)
Minimum Passing Marks: 40%

Course Description:

This course provides knowledge and skills essential for effective academic communication and publishing. It focuses on developing the ability to write research papers, abstracts, and proposals, and understanding the ethics and practices of scholarly publishing.

Course Objectives:

- To develop effective academic writing skills for research dissemination.
- To introduce students to the process and formats of scholarly publishing.
- To familiarize students with tools for citation management and plagiarism checks.
- To promote ethical practices in research communication and publication.

Course Outcomes:

- Draft research abstracts, proposals, and papers with academic rigor.
- Identify appropriate journals and publication formats.
- Use citation tools and plagiarism checkers effectively.
- Understand ethical issues like authorship, peer review, and misconduct.

Units and Topics:

Units	Topic	No. of Lectures
I	**Academic Writing**: Structure of scientific papers, abstract, introduction, methods, discussion, and conclusion writing; writing style and clarity	6
II	**Scholarly Publishing**: Types of publications (research papers, review articles, short communications); choosing journals; impact factor and indexing	6
III	**Referencing & Plagiarism**: Citation styles (APA, MLA), reference managers (Zotero, Mendeley); plagiarism: tools and ethical issues	4
IV	**Research Ethics & Communication**: Authorship norms, peer review process, predatory journals, conference presentations, open access publishing	4

Suggested Readings:

1. Day, R. A., & Gastel, B. (2016). *How to Write and Publish a Scientific Paper* (8th ed.). Cambridge University Press.

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2. Alley, M. (1996). *The Craft of Scientific Writing*. Springer.
3. APA (2020). *Publication Manual of the American Psychological Association* (7th ed.).
4. COPE Guidelines (Committee on Publication Ethics) – https://publicationethics.org
5. Elsevier Researcher Academy Modules – https://researcheracademy.elsevier.com

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M.Sc. FOOD AND NUTRITION

ARTIFICIAL INTELLIGENCE IN FOOD AND NUTRITION

Credits: 4

Course Type: Practical / Applied

Duration: One Semester

Course Objectives

Students will be able to:

1. Use AI tools in nutritional assessment and meal planning.
2. Apply AI for therapeutic diet preparation.
3. Create digital nutrition education materials.
4. Develop practical and entrepreneurial skills using AI.
5. Use AI for nutrition counselling and awareness programmes.

Course Outcomes

Students will be able to:

- Prepare AI-assisted diet plans.
- Conduct nutrient analysis using digital applications.
- Develop digital nutrition awareness content.
- Create healthy recipe books and counselling material.
- Use AI tools for nutrition-related projects.

Practical Component

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Students shall perform the following practical activities:

1. Nutrient calculation using AI applications.
2. Preparation of balanced diets for different age groups.
3. AI-assisted meal planning for:
    i. Diabetes
    ii. Hypertension
    iii. Obesity
    iv. Anaemia
    v. PCOS
4. Development of:
    i. Nutrition counselling charts
    ii. Healthy recipe booklet
    iii. Digital awareness posters
    iv. Nutrition education videos
    v. Social media health posts
5. Conduct one online nutrition awareness campaign.
6. Compare manual and AI-generated diet plans.
7. Prepare one applied project related to:
    i. Community nutrition
    ii. Smart meal planning
    iii. Lifestyle disease management
    iv. Child nutrition

Records to be Submitted

1. Practical file
2. Nutrient analysis sheets
3. Therapeutic diet file

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4. Recipe booklet
5. Awareness material portfolio
6. Applied project report

Suggested AI Tools- ChatGPT, HealthifyMe, MyFitnessPal, Canva AI, Google Gemini

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ IV SEM
Course Code- CC-12
INTERNSHIP
(10 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: IV**

Course Description: This course is designed to provide students with an opportunity to apply the theoretical knowledge and conceptual understanding gained during coursework in a real-world or simulated professional environment. It emphasizes hands-on training, practical exposure, and skill refinement in the student's chosen area of specialization. Through experiential learning, students will develop greater proficiency, enhance their analytical and problem-solving skills, and learn to evaluate and improve practices based on situational analysis. The course aims to foster independent thinking, adaptability, and technical competence in diverse practical settings.

Course Code: CC-12	**Course Title: INTERNSHIP**

Course Objective:

- To enable the students to acquire an in-depth understanding of the practical aspects of knowledge and skills acquired during the course work in the relevant subjects.
- To gain hands on experience for higher proficiency in their selected area of expertise.
- To help the students to develop and have their analytical abilities for situation analysis and bringing about improvements.

Course Outcomes: Upon successful completion of this course, students will be able to:

1. Apply theoretical knowledge in practical settings to gain meaningful, hands-on experience in their area of specialization.
2. Demonstrate technical proficiency and professional skills relevant to their chosen field of study.
3. Critically analyze practicalsituationsand use evidence-based approaches to identify gaps and suggest improvements.
4. Develop problem-solving and decision-making skills by engaging in real-life scenarios and practical challenges.
5. Enhance communication, teamwork, and adaptability through structured fieldwork or lab-based experiences.
6. Reflect on personal and professional growth through documentation, feedback, and self-assessment during the course of training.

Credits: 10	**Course Type- Core Course**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)	**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)

Total No. of Lectures: Practical (300)

Practical:	The student will be required to undergo an internship/field placement for the total duration of 6-8 weeks in their chosen area of interest which will facilitate their pursing a professional career in the same field. This program could be taken up either as a single block or in two different blocks. It is mandatory that the organization/ institution (public/private) participating in the field placement programme be of good professional standing. The list could include hospitals, state/un/NGO administered	**300**

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	public nutrition programmes, food industry etc. the students will be required to submit and present a report of the internship/ field placement project after its completion. It is also envisaged that the participating organization/institution will give their performance appraisal of the student work.	

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M.Sc. HOME SCIENCE (FOOD AND NUTRITION)
II YEAR/ IV SEM
Course Code- CC-11
DISSERTATION
(10 Credits)

Programme- M.Sc. Home Science (Food and Nutrition)	**Year: Second**	**Semester: IV**
Course Description: This course is designed to equip students with the foundational knowledge and practical skills required for preparing a research synopsis. It emphasizes the critical steps involved in initiating a research project—ranging from topic selection to hypothesis formulation, sampling design, development of research tools, and standardization of procedures. Students will also gain competence in applying statistical methods for data analysis and citing sources using APA (7th edition) referencing style. The course culminates in the structured presentation of the research synopsis, thereby enhancing students' academic writing and presentation skills.		
Course Code: CC-11	**Course Title: DISSERTATION**	
Course Objective: By the end of this course, students will be able to: • Understand the process of selecting a meaningful and researchable topic. • Formulate clear and achievable research objectives and hypotheses. • Design appropriate research methodologies and sampling strategies. • Develop and validate effective tools for data collection. • Apply standardization techniques and ethical practices in data collection. • Perform basic statistical analysis for interpreting research data. • Use correct APA 7th edition referencing and citation format. • Present a comprehensive and well-structured research synopsis.		
Course Outcomes: Upon successful completion of the course, students will be able to: • Select and define a relevant research problem with academic and societal significance. • Frame specific objectives and hypotheses aligned with the research topic. • Design a suitable research methodology including sampling technique and sample size determination. • Construct or select appropriate tools such as questionnaires, interview schedules, and rating scales for data collection. • Standardize research tools and procedures to ensure reliability and validity. • Apply relevant statistical techniques for data analysis and interpretation. • Accurately cite sources and prepare a reference list using APA 6th edition style. • Effectively communicate their research plan through a formal synopsis presentation.		
Credits: 10		**Course Type- Open Elective**
Max. Marks: **Semester:** Theory (70) + Practical (30) **Sessional:** Theory (20) + Practical (15)		**Min. Passing Marks:** **Semester:** Theory (28) + Practical (10) **Sessional:** Theory (08) + Practical (06)
Total No. of Lectures: Theory (75) +Practical (150)		

Units	**Topic**	**No. of Lectures**
I	Preparation of the synopsis in context of the following points- • Selection of the research topic • Objectives • Research Design • Formulation of Hypothesis	75

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	• Sampling design and size • Selection/ Development of tools for data collection, e.g. Questionnaire, Interview Schedule, Observation, Rating Scale etc. • Standardization of procedures (as per requirement) • Statistical Analysis • References and Citations (APA Style, 6th Edition) • Presentation	
Practical:	Presentation of final dissertation and viva based on final dissertation.	**150**

Suggested Readings:

Kothari, C. R., & Garg, G. (2019). *Research Methodology: Methods and Techniques* (4th ed.). New Age International Publishers.
→ Comprehensive guide covering research design, hypothesis, sampling, and statistical analysis.
Kumar, R. (2019). *Research Methodology: A Step-by-Step Guide for Beginners* (5th ed.). SAGE Publications.
→ Beginner-friendly book for selecting a topic, setting objectives, and data collection tools.
Best, J. W., & Kahn, J. V. (2016). *Research in Education* (10th ed.). Pearson.
→ Especially useful for understanding educational and social science research methodology.

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Template of M.Sc. Home Science (Food & Nutrition) Syllabus

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M.Sc. Food & Nutrition – Batch: (2026–2027)

Semester - I

S. No.	Course Type	Course Code	Course Name	L	T	P	Credits	Internal (50)				External (100)		Total Marks
								Attendance	Project Report (5) + PPT/ Assignment (5)	Practical + Record + Viva	Theory	Practical	Theory	
1	Core Course-1	MSCHS-101	Research Methodology and Academic Writing	3	0	2	4	5	10	20	15	30	70	150
2	Core Course-2	MSCFN-102	Advanced Nutritional Biochemistry	3	0	2	4	5	10	20	15	30	70	150
3	Core Course-3	MSCFN-103	Human Physiology	3	0	2	4	5	10	20	15	30	70	150
4	Core Course-4	MSCFN-104	Advances in Food Microbiology	3	0	2	4	5	10	20	15	30	70	150
5	Department Elective DEC-1	MSCFN-105	Methods of Investigation	3	0	2	4	5	10	20	15	30	70	150
6	Seminar	MSCHS-106	Seminar	0	0	4	2	5	10	40	-	50	-	100
7	VAC-1	MSCFN-AI	Artificial Intelligence in Food & Nutrition	0	0	4	2	5	10	20	-	70	-	100
Total				**15**	0	18	**24**	35	70	160	75	**270**	350	950

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Semester - II

S. No.	Course Type	Course Code	Course Name	L	T	P	Credits	Internal (50)				External (100)		Total Marks
								Attendance	Project Report (5) + PPT/ Assignment (5)	Practical + Record + Viva	Theory	Practical	Theory	
1	Core Course-5	MSCHS-201	Statistics and Computer Application	3	0	2	4	5	10	20	15	30	70	150
2	Core Course-6	MSCFN-202	Advance Nutrition	3	0	2	4	5	10	20	15	30	70	150
3	Core Course-7	MSCFN-203	Food Science	3	0	2	4	5	10	20	15	30	70	150
4	Core Course-8	MSCFN-204	Nutrition for Health & Fitness	3	0	2	4	5	10	20	15	30	70	150
5	Department Elective DEC-2	MSCFN-205	Food Packaging and Sensory Evaluation	3	0	2	4	5	10	20	15	30	70	150
6	VAC-2	CHM-002	Constitutional, Human Values and Moral Values and IPR	2	0	0	2	0	0	-	-	-	50	50
Total				17	0	10	22	25	50	100	75	150	400	800

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Semester - III

Specializations - A - Clinical and Therapeutic Nutrition

S. No.	Course Type	Course Code	Course Name	L	T	P	Credits	Internal (50)				External (100)		Total Marks
								Attendance	Project Report (5) + PPT/ Assignment (5)	Practical + Record + Viva	Theory	Practical	Theory	
1	Core Course-9	MSCFN-301	Clinical and Therapeutic Nutrition	3	0	2	4	5	10	20	15	30	70	150
2	Core Course-10	MSCFN-302	Institutional Food Management	3	0	2	4	5	10	20	15	30	70	150
3	Department Elective DEC-3	MSCFN-303	Assessment of Nutritional Status	3	0	2	4	5	10	20	15	30	70	150
4	Department Elective DEC-4	MSCFN-304	Pediatric Nutrition	3	0	2	4	5	10	20	15	30	70	150
5	Department Elective DEC-5	MSCFN-305	Current Trends & Issues in Food & Nutrition	3	0	2	4	5	10	20	15	30	70	150
6	OEC	MSCHS - 306	Choose any one from OEC Basket	0	0	4	2	5	10	20	-	70	-	100
Total				15	0	14	22	30	60	120	75	220	350	850

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Specializations –B - Public Health Nutrition

S. No.	Course Type	Course Code	Course Name	L	T	P	Credits	Internal (50)				External (100)		Total Marks
								Attendance	Project Report (5) + PPT/ Assignment (5)	Practical + Record + Viva	Theory	Practical	Theory	
1	Core Course-9	MSCFN-301	Public Health Nutrition	3	0	2	4	5	10	20	15	30	70	150
2	Core Course-10	MSCFN-302	Maternal and Child Health	3	0	2	4	5	10	20	15	30	70	150
3	Department Elective DEC-3	MSCFN-303	Assessment of Nutritional Status	3	0	2	4	5	10	20	15	30	70	150
4	Department Elective DEC-4	MSCFN-304	Community Health Nutrition	3	0	2	4	5	10	20	15	30	70	150
5	Department Elective DEC-5	MSCFN-305	Current Trends & Issues in Food & Nutrition	3	0	2	4	5	10	20	15	30	70	150
6	OEC	MSCHS - 306	Choose any one from OEC Basket	0	0	4	2	5	10	20	-	70	-	100
Total				15	0	14	22	30	60	120	75	220	350	850

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Specializations –C -Food Science

S. No.	Course Type	Course Code	Course Name	L	T	P	Credits	Internal (50)				External (100)		Total Marks
								Attendance	Project Report (5) + PPT/ Assignment (5)	Practical + Record + Viva	Theory	Practical	Theory	
1	Core Course-9	MSCFN-301	Food Processing and Technology	3	0	2	4	5	10	20	15	30	70	150
2	Core Course-10	MSCFN-302	Advance Food Science	3	0	2	4	5	10	20	15	30	70	150
3	Department Elective DEC-3	MSCFN-303	Food Safety and Quality Control	3	0	2	4	5	10	20	15	30	70	150
4	Department Elective DEC-4	MSCFN-304	Advance Food Science II	3	0	2	4	5	10	20	15	30	70	150
5	Department Elective DEC-5	MSCFN-305	Current Trends & Issues in Food & Nutrition	3	0	2	4	5	10	20	15	30	70	150
6	OEC	MSCHS - 306	Choose any one from OEC Basket	0	0	4	2	5	10	20	-	70	-	100
Total				15	0	14	22	30	60	120	75	220	350	850

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Specializations –D - Sports Nutrition

S. No.	Course Type	Course Code	Course Name	L	T	P	Credits	Internal (50)				External (100)		Total Marks
								Attendance	Project Report (5) + PPT/ Assignment (5)	Practical + Record + Viva	Theory	Practical	Theory	
1	Core Course-9	MSCFN-301	Clinical Sports Nutrition	3	0	2	4	5	10	20	15	30	70	150
2	Core Course-10	MSCFN-302	Nutrition for Special Groups and Sports Injuries	3	0	2	4	5	10	20	15	30	70	150
3	Department Elective DEC-3	MSCFN-303	Dietary Supplements & Ergogenic Aids	3	0	2	4	5	10	20	15	30	70	150
4	Department Elective DEC-4	MSCFN-304	Advanced Techniques in Nutritional Assessment for Athletes	3	0	2	4	5	10	20	15	30	70	150
5	Department Elective DEC-5	MSCFN-305	Current Trends & Issues in Food & Nutrition	3	0	2	4	5	10	20	15	30	70	150
6	OEC	MSCHS - 306	Choose any one from OEC Basket	0	0	4	2	5	10	20	-	70	-	100
Total				15	0	14	22	30	60	120	75	220	350	850

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Semester - IV

S. No.	Course Type	Course Code	Course Name	L	T	P	Credits	Internal (50)				External (100)		Total Marks
								Attendance	Project Report (5) + PPT/ Assignment (5)	Practical + Record + Viva	Theory	Practical	Theory	
1	Dissertation	M.SCHS-401	Dissertation/ Project	0	0	24	12	5	10	20	-	70	-	100
2	Department Elective DEC-6	M.SCHS-402	Internship	0	0	8	4	5	10	20	-	70	-	100
3	EEC (EEC-1)	M.SCHS-403	Research Communication and Scholarly Publishing	0	0	4	2	5	10	20	-	70	-	100
4	Department Elective DEC-7	M.SCHS-404	Community Engagement for SDGs	0	0	8	4	5	10	30	-	70	-	100
Total				**4**	**0**	**44**	**22**	**20**	**40**	**90**	**-**	**280**	**-**	**400**

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DEPARTMENT OF HOME SCIENCE

BASKETS (PG PROGRAMMES)

SESSION (2026-2027)

LIST OF DISCIPLINE ELECTIVES COURSE

(Offered by H. Sc. Deptt. to university basket)- Annexure I

M.SC. HUMAN DEVELOPMENT					
Sr. No.	**Course Type**	**Course Name**	**Semester**	**Year**	**Credits**
1	DEC-1	Contemporary Issues in Human Development	Semester - I	1st Year	4
2	DEC-2	Psychosocial Well-being across Lifespan	Semester - II	1st Year	4
A/B/C/D (As per run in the department on choice of group in department students.					
GROUP- A					
3	DEC-3A	Career Counselling and Vocational Guidance	Semester - III	2nd Year	4
4	DEC-4A	Mental Health and Counselling across Lifespan	Semester - III	2nd Year	4
5	DEC-5A	Counselling Special Groups	Semester - III	2nd Year	4
GROUP- B					
6	DEC-3B	Learning and Play in Early Years	Semester - III	2nd Year	4
7	DEC-4B	Inclusive Practices in ECCE	Semester - III	2nd Year	4
8	DEC-5B	Child Rights and Protection	Semester - III	2nd Year	4
GROUP- C					
9	DEC-3C	Intervention Strategies for Children with Special Needs	Semester - III	2nd Year	4
10	DEC-4C	Assistive Technology and Inclusion	Semester - III	2nd Year	4
11	DEC-5C	Emotional and Behavioural Disorders	Semester - III	2nd Year	4
GROUP- D					
12	DEC-3D	Family Life Education	Semester - III	2nd Year	4
13	DEC-	Work-Family Interface	Semester - III	2nd Year	4

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	4D				
14	DEC-5D	Family Stress and Coping	Semester - III	2nd Year	4
M.SC. FOOD AND NUTRITION					
Sr. No.	**Course Type**	**Course Name**	**Semester**	**Year**	
1	DEC-1	Methods of Investigation	Semester - I	1st Year	4
2	DEC-2	Food Packaging and Sensory Evaluation	Semester - II	1st Year	4
3	DEC-3A	Current Trends & Issues in Food & Nutrition	Semester - III	2nd Year	4
GROUP A					
4	DEC-4A	Pediatric Nutrition	Semester - III	2nd Year	4
GROUP B					
5	DEC-3B	Community Health Nutrition	Semester - III	2nd Year	4
GROUP C					
6	DEC-4C	Food Safety and Quality Control	Semester - III	2nd Year	4
7	DEC-5C	Advance Food Science II	Semester - III	2nd Year	4
GROUP D					
8	DEC-1C	Dietary Supplements & Ergogenic Aids	Semester - III	2nd Year	4
9	DEC-2C	Advanced Techniques in Nutritional Assessment for Athletes	Semester - III	2nd Year	4
COMMON WITH GROUP A, B					
10	DEC-3A	Assessment of Nutritional Status	Semester - III	2nd Year	4
MA HOME SCIENCE					
Sr. No.	**Course Type**	**Course Name**	**Semester**	**Year**	
1	DEC-1	Surface Ornamentation	Semester - I	1st Year	4
2	DEC-2	Traditional Indian Textiles	Semester - II	1st Year	4
3	DEC-3	Apparel Design & Clothing Construction	Semester - III	2nd Year	4
4	DEC-4	Interior Decoration	Semester - III	2nd Year	4
5	DEC-5	Entrepreneurship Development	Semester - III	2nd Year	4

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7	DEC-6	Community Engagement for SDGs	Semester - IV	2nd Year	4
COMMON IN ALL PG PROGRAMMES					
1	DEC-7	Community Engagement for SDGs	Semester - IV	2nd Year	

LIST OF OPEN ELECTIVES COURSE

(All PG Programmes) Offered by H.Sc. Deptt. to university basket- Annexure II

(Select any one, it shall be run with 10 students at minimum)

Sr. No.	Course Type	Course Name (Choose any one from basket)	Semester	Year	Credits
1	OEC-1	Creative Craft	Semester - III	2nd Year	2
2	OEC-2	Traditional Textiles	Semester - III	2nd Year	2
3	OEC-3	Food Preservation	Semester - III	2nd Year	2

LIST OF VALUE ADDED COURSE (Offered by H.Sc. Deptt. to university basket)- Annexure III

Sr. No.	Course Type	Course Name	Semester	Year	Credits
3	VAC-1	Counselling Skills	Semester - I	1st Year	2
4	VAC-2	Administration Management and Creative Activities in ECCE	Semester - I	1st Year	2
1	VAC-3	Ayurveda & Nutrition	Semester - II	1st Year	2
2	VAC-4	Food Processing	Semester - II	1st Year	2

LIST OF EECC COURSE (Offered by H.Sc. Deptt. to university basket)- Annexure III

Sr. No.	Course Type	Course Name	Semester	Year	Credits
COMMON FOR ALL PG PROGRAMS					
1	EECC-1	Research Communication and Scholarly Publishing	Semester - IV	II	2

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