Kurukshetra University, Kurukshetra

(Established by the State Legislature Act-XII of 1956)
("A++" Grade, NAAC Accredited)

Syllabus of the Programme
for
Post Graduate Programme

M.Sc. Home Science (Food, Nutrition and Dietetics)

as per NEP 2020
Curriculum and Credit Framework for Postgraduate Programme

With Multiple Entry-Exit, Internship and CBCS-LOCF
With effect from the session 2024-25(in phased manner)

DEPARTMENT OF HOME SCIENCE

FACULTY OF LIFE SCIENCES

KURUKSHETRA UNIVERSITY, KURUKSHETRA -136119
HARYANA, INDIA

Chairperson
Dept. of Home Science
K. U. KURUKSHETRA.

Session: 2024-25			
Part A – Introduction			
Name of Programme	M.Sc. Home Science (Food, Nutrition and Dietetics)		
Semester	I		
Name of the Course	Advanced Human Nutrition- I		
Course Code	M24-FND-101		
Course Type	CC-1		
Level of the course	400-499		
Pre-requisite for the course (if any)	B.Sc. Home Science/Any branch of life Sciences or Food/Nutrition/Dietetics as one of the main subject at under graduate level		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO1: Learn about pphysiological and metabolic role of various nutrients and their interactions in human nutrition. CLO2: Understand the basis of human nutritional requirements and recommendations throughout the life cycle. CLO3: Learn the actions of nutrients and their implications. CLO4: Familiarize with the recent advances in nutrition.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	**1. Carbohydrates:** 1.1) Digestion, absorption and transport- review. 1.2) Chemical composition and physiological effect of dietary fiber, fructo-oligosaccharides and resistant starch. 1.3) Glycemic index and Glycemic load of foods. 1.4) Sweeteners- nutritive and non-nutritive. 1.5) Role of carbohydrates in health and disease, health significance of carbohydrates. **2. Lipids**: 2.1) Digestion, absorption, transport – review, 2.2) Functions of EFA. Role of n-3, n-6 fatty acids in health and disease. 2.3) Requirements of total fat and fatty acids. Trans fatty acids. Prostaglandins 2.4) Health significance of lipids.	15

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II	**3. Proteins:** **3.1)** Digestion, absorption and transport - review. 3.2) Protein quality, methods of evaluating protein quality. 3.3) Protein and amino acid requirements. 3.4) Protein as an energy source. 3.5) Therapeutic applications of specific amino acids: Branched chain, glutamine, arginine, homocysteine, cysteine, taurine, health significance of proteins. **4. Interaction of Nutrition, Immunity & Infection:** 4.1) Host defence mechanism and nutrients essential in the development of immune system. 4.2) Effect of infection on the nutritional status of an individual, impact of malnutrition on immunity and occurrence of infection.	15
III	**5. Vitamins:** Historical background, food sources, RDA, biochemical functions, physiological functions & therapeutic effects, toxicity and deficiency with respect to the following: 5.1) Fat soluble vitamins: A, D, E & K. 5.2) Water soluble vitamin: Thiamine, riboflavin, niacin, biotin, pyridoxine, folic acid, pantothenic acid, ascorbic acid, cyanocobalamin, choline, inositol.	15
IV	**6. Minerals:** Historical background, food sources, RDA, biochemical functions, physiological functions & therapeutic effects, toxicity and deficiency with respect to the following: 6.1) Macro minerals: calcium, phosphorus, magnesium, sodium, potassium and chlorine. 6.2) Micro minerals: Iron, copper, zinc, manganese, iodine, fluorine. 6.3) Trace minerals: Selenium, cobalt, chromium, vanadium, silicon, boron, nickel.	15
	Total Contact Hours	60

Suggested Evaluation Methods

Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Modern Nutrition in: Health and Disease – Goodhearth, R. S.
2. Recommended dietary allowance for Indian – I.C.M.R., 1980
3. Nutrition and Development- Winick 1973, Univ. of Calombia.

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4. Biology of Nutrition – Eclames 1972, Palaniuma Press
5. Foods & Nutrition – Krause 1972, Saunders.
6. Proteins and Human Foods 1970, Lowrie, Avi. Pub. Co.
7. Nut. &Physical; fitness-BoGert L.J.
8. Principles of Nut. – Wilson, L.D. and Fisher. K.H.
9. Standardised diets for Hospital – National Nut. Advisory Committee
10. Nutrition in Health & Disease – Cooper, L. Barher, L. Mitchell, HandRynheraen.
11. Nutrition A comprehensive: Beaton and McHanery, Treatise Vol-1, II, & III.
12. Human Nut. &Dietectics- Davidson S., Passmore, R., Brook, J.E. and Truswell.
13. Foods and Nut. - Rankin, W. Munn. Hildath E.N.
14. Iron deficiency – Holiberth, H.C. Harvorth, vannotti, N.Y.
15. Trace Elements in Human and Animal Nut. – Underwood, N.Y.
16. Essays in Biochemistry – Samul Graff, Tandon Book Dept. Sec. –16
17. Diabetes Mellitus- The Williams and Wilkinas Co., U.S.A.

Session: 2024-25			
Part A–Introduction			
Name of Programme	M.Sc. Home Science (Food, Nutrition and Dietetics)		
Semester	I		
Name of the Course	Advanced Nutritional Biochemistry- I		
Course Code	M24-FND-102		
Course Type	CC-2		
Level of the course	400-499		
Pre-requisite for the course (if any)	B.Sc. Home Science/Any branch of life Sciences or Food/Nutrition/Dietetics as one of the main subject at under graduate level		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO1: Understand the fundamentals of energetics of biochemical reactions. CLO2: Comprehend the different aspects of carbohydrates, lipids, proteins, enzymes and nucleic acids as biomolecules. CLO3: Know the mechanism of action of hormones. CLO4: Learn basic idea about nutrigenomics and nutraceuticals.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	**1. Principals of Bioenergetics-** 1.1) Concept of free energy, Oxidation and reduction, Concept of cell, 1.2) High energy compounds (ATP, PEP, and Phosphogens), role of ATP/ADP cycle in transfer of high energy phosphates. 1.3) Concept of coupled reactions, equilibrium & non- equilibrium reactions, committed steps. 1.4) Caloric homeostasis & futile cycles. **2. Carbohydrates-** 2.1) Definition, classification, monosaccharides: Classification, occurrence, structure. 2.2) Stereoisomerism (DL and RS systems), optical isomerism. 2.3) Chemical reactions of the functional groups, derivatives of monosaccharides- deoxy sugars and amino sugars. 2.4) Disaccharides of nutritional importance (sucrose, maltose, lactose).	15

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	2.5) Polysaccharides- Homopolysaccharides- starch, glycogen, cellulose, Heteropolysaccharides- pectin, glycoproteins- O-linked and N-linked, peptidoglycans, proteoglycans, mucopolysaccharides, glycobiology and glycomics.	
II	**3. Lipids-** 3.1) Definition, classification. Structure, Properties and functions of fatty acids (including essential fatty acids) Trans fatty acids, prostaglandins, acylglycerols, phospholipids, sphingolipids, glycolipids, steroids (including role of cholesterol). 3.2) Chemical composition and biological role of lipoproteins. 3.3) Characterization of fats- saponification, iodine, acid, acetyl and peroxide value. **4. Amino Acids and Proteins-** 4.1) Common structural features, classification based on the nature of R group, non-protein amino acids, essential amino acids. 4.2) Titration curves of monoamino-monocarboxilic, monoamino-dicarboxilic and diamino-monocarboxilic acids. Chemical reactions of amino acids 4.3) Peptide bond, biological role of proteins, classification of proteins. 4.4) Levels of protein structure- primary, **secondary structure of proteins:** Alpha helix and beta sheets; 310-helix, 3.613-helix, 4.416-helix, Collagen helix and other types of helical structures; Super secondary structures; tertiary and quaternary structure, forces stabilizing protein structure. 4.5) Denaturation and renaturation of proteins, protein conformation and diseases.	15
III	**5. Enzymolozy-** 5.1) General Characteristics, classification and nomenclature, coenzyme, cofactor, prosthetic group, concept of holoenzyme and apoenzyme, units of enzyme activity. 5.2) Multienzyme systems and multifunctional enzymes with specific examples and significance. 5.3) Enzyme kinetics- Michaelis-Menten and Lineweaver-Burk equation for monosubstrate reactions, *Km*, *kcat*(turnover number), bisubstrate reactions. **6. Mechanism of Action of Hormones-**	15

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	6.1) Classes of hormones. 6.2) Signal transduction and intracellular messengers. 6.3) Chemistry, functions mechanism of action of thyroid, parathyroid, adrenal, pancreatic, gastric, and reproductive hormones, hypothalamus and pituitary, hormone replacement therapy. 6.4) Regulation of growth hormone, ADH, oxytocin, thyroid hormones, mineralocorticoid, glucocorticoid, insulin, glucagon, parathyroid hormone, and male and female reproductive hormones.	
IV	**7. Nucleic Acids-** 7.1) DNA/RNA bases, Nucleosides, Nucleotides, oligonucleotides; Structure and properties of purines and pyrimidine bases; structure and functions of nucleotides. 7.2) Experimental proof of DNA and RNA as genetic material, Chargaff's rules, double helical model of DNA (A, B and Z), DNA packaging, types of RNA and their functions. **8. Nutrigenomics and Nutraceuticals.**	15
	Total Contact Hours	60

Suggested Evaluation Methods

Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Harper's Biochemistry- Robert K. Murray
2. Textbook of Biochemistry- West and Todd
3. Biochemical aspect of Nutrition – S.X.C.- Okoyo
4. Food Chemistry – O.R. Fennema
5. Biochemistry– Voet and Voet
6. Principles of Biochemistry – A.L. Lehninger
7. Outlines of Biochemistry- E. E. Conn
8. Practical Clinical Biochemistry- Harold Varley

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Session: 2024-25			
Part A–Introduction			
Name of Programme	M.Sc. Home Science (Food Nutrition and Dietetics)		
Semester	**I**		
Name of the Course	**Food Science**		
Course Code	M24-FND-103		
Course Type	CC-3		
Level of the course	400-499		
Pre-requisite for the course (if any)	B.Sc. Home Science/Any branch of life Sciences or Food/Nutrition/Dietetics as one of the main subject at under graduate level		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Learning about the basic concepts and composition of food. CLO 2: Giving knowledge about the principles of food science in various food preparations. CLO 3: Familiarize with changes occurring in various Food stuffs as a result of processing and cooking. CLO 4: Gain the theoretical knowledge of food science in day-to-day life.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	**1 Starch Cookery:** 1.1 Sources, types and uses of starch, gelatinization. 1.2 Flours- Composition and baking qualities. Batters and dough (chapatti and poori), Leavening agents: biologically and chemically leavened products. 1.3 Cooking and parboiling of rice. **2 Grams and Dhals:** 2.1 Composition, methods of processing and cooking. 2.2 Effect of processing such as roasting, parching, soaking, germination and fermentation. 2.3 Toxins in pulses. **3 Sensory Evaluation:** 3.1 Sensory characteristics of food: appearance, colour, flavor, odour, taste.	15

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	mouth feel and texture, 3.2 Objective and subjective evaluation	
II	**4 Vegetables and Fruits:** 4.1 Composition, classification of fruits and vegetables 4.2 Pigments and acids in vegetables and fruits, browning reaction. 4.3 Pectic substances: Characteristics, methods of artificial ripening, testing of pectin, factors affecting jelly formation, 4.4 Loss of nutrients while cooking vegetables and it's solutions. **5 Sugar Cookery:** 5.1 Introduction, types & uses 5.2 Properties of crystallization of sugar, 5.3 Stages of sugar cookery, 5.4 Physical and chemical properties of sugar, 5.5 Sweetness index, 5.5 Fondant, fudge, caramel and brittles. **6 Beverages:** 6.1 Classification and types of beverages 6.2 Major beverages such as coffee, tea, cocoa, malted drinks.	15
III	**7 Fats and Oils:** 7.1 Sources, structure and type of fats 7.2 Physical & chemical properties 7.3 Cooking of fats and oils, fat deterioration and antioxidants. **8. Milk and Milk products:** 8.1 Composition and components of milk. Milk types. 8.2 Coagulation of milk protein. 8.3 Setting of curds, different types of cheese, non-enzymatic browning. **9. Dairy products:** 9.1 Cultured milk, Yogurt, Butter, Whey 9.2 Concentrated and dried products, frozen desserts, 9.3 Dairy product substitutes.	15
IV	**10Eggs:** 10.1 Structure, composition and selection. 10.2 Changes during storage and spoilage. 10.3 Coagulation of eggs protein: proteins in egg white and yolk, egg fat.	15

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	10.4 Egg types. Eggs cooked in shells, poached eggs, and omelets, 10.5 Units of egg quality, egg products **11. Meat:** 11.1 Structure, constituents and types of meat, 11.2 Meat protein, post-mortem changes, ageing of meat, curing and smoking, meat analogues: types and characteristics, 11.3 Tenderness and juiciness. 12 **Fish and sea food:** 12.1 Types and composition, Storage, selection, spoilage and preservation, 12.2 Byproducts and newer products of fish	
Total Contact Hours		60

Suggested Evaluation Methods

Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Experimental Cookery: Low Bells.
2. Food Selection and Preparation: Sweetman, M.D.
3. Handbook of Food Preparation: A.N. Hime Ec. Asso.
4. Our Food: Swaminathan, M, and Bhagiam, R.K.
5. Experimental Foods: Swaminathan
6. Food Science and Application: L Paul, C. Pauling.
7. Food Science: Mudami, S.R. &Rao, S.M. 1994, Wiley Eastern Ltd. New Delhi
8. Food Facts & Principles: Maney N. S. &ShudarshanSwamy M. 1966. New Age International Pub. N. Delhi

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Session: 2024-25			
Part A–Introduction			
Name of Programme	M.Sc. Home Science (Food Nutrition and Dietetics)		
Semester	I		
Name of the Course	**Food Service Management**		
Course Code	M24-FND-104		
Course Type	CC- 4		
Level of the course	400-499		
Pre-requisite for the course (if any)	B.Sc. Home Science/Any branch of life Sciences or Food/Nutrition/Dietetics as one of the main subject at under graduate level		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Learning about the basic concepts & Introduction of food service management. CLO 2: Gaining knowledge in managing various food service system. CLO 3: Understand and manage resources in food service Institutions. CLO 4: Gain Knowledge about experiences in managing food safety hygiene and regulations for food service industries.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	**1. Introduction to the food service system:** 1.1 Introduction, definition, History and development, types of the food service industry, principles of food service system, objectives of the food service industry Classification of catering services: commercial and institutional, Characteristics of the various types of food service units – Canteens, Hostels, Hospitals and Restaurants. 1.2 Institutional catering to different types of handicapped personnel. **2. Management, Approaches & Management Tools**	15

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	2.1 Management principles, functions, approaches and theories of management-classical or traditional theory, Neoclassical approach. Quantitative approach, MBO approach, system approach, Behavioural and human relations, Contingency approach, JIT approach. 2.2 Management tools-tangible and intangible tools, organisational chart, structure, function, work improvement techniques. Equipment and time and energy management 2.3 Manpower planning- recruitment, selection, orientation and training	
II	**3 Financial Management** 3.1 Definition, and scope of financial management, financial accounting, management accounting, budgeting, sources of finance, types of budgets, costing, and cost control techniques **4 Personnel Management** 4.1 Personnel Management-Definition, Scope, Concept, Approaches and Personnel Policies, Staff Employment, Training, Placement, Promotion, Personnel Records and Work Appraisal. 4.2 Marketing strategies, sales analysis, sales records, issuing process, receiving process, purchasing process and methods	15
III	**5. Material Management** 5.1 Material Management, quantity food preparation and service, large cooking techniques, principles of quantity food purchase, selection, buying and accounting of different foods. 5.2 Storage methods, store records and Layout of Stores **6 Menu planning and service in the food service industry** 6.1 Menu definition, steps in menu planning, types of menus and Factors affecting menu planning 6.2 Layout of kitchen and service area, kitchen control, Maintenance of kitchen records & Architectural features of the kitchen, Meal Ordering system (manual &electronic) 6.3 Types of food service styles in different catering institutions, factors in planning menus for large groups, systems for maintaining quality in food preparation and food service	15
IV	**7. Food safety hygiene and regulations in the food service industry** 7.1 Hygiene & sanitation in food preparation and serving area -personal hygiene, types and sources of contamination, prevention, safety	15

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	measures methods of controlling infestation and methods of dishwashing 7.2 HACCP, GMP (Goods Manufacturing Practices), GHP (Goods Hygiene Practices), 7.3 FSSAI 2006, Different food standards and regulations in the food service industry 7.4 Labour laws and Welfare policies and schemes for employees, Offences and Penalties	
Total Contact Hours		60

Suggested Evaluation Methods

Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Food Service in Institutions – Wood
2. Food Service in Institutions – West, Bessin, Brooks.
3. Handbook of Food Preparations – A.M. Home Economics Association.
4. Food Selection and Preparations – Sweetman, M.D., 4, Mackeller.
5. School Lunch Room Service – Oliver B. Watson.
6. Food service Planning: layout Equipment – Lender H. Ketshevar and Marget E. Terrel.
7. Human Nutrition and Dietetics – Davidson and Passmore

Session: 2024-25			
Part A – Introduction			
Name of the Programme	PG Home Science (Food, Nutrition and Dietetics)		
Semester	I		
Name of the Course	Advanced Human Nutrition and Advanced Nutritional Biochemistry-I		
Course Code	M24-FND-105		
Course Type	PC-1		
Level of the course	400-499		
Pre-requisite for the course (if any)	B.Sc. Home Science/Any branch of life Sciences or Food/Nutrition/Dietetics as one of the main subject at under graduate level		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Measure blood pressure, BMI and body fat. CLO 2: Acquire skills to prepare standard solution. CLO 3: Estimate biomolecules and minerals. CLO 4: Assess the enzyme activity.		
Credits	Theory	Practical	Total
	0	4	4
Teaching Hours per week	0	8	8
Internal Assessment Marks	0	30	30
End Term Exam Marks	0	70	70
Max. Marks	0	100	100
Examination Time	0	4 hours (or as decided by PGBOS)	

Part B-Contents of the Course

Practicals	Contact Hours
a) Advanced Human Nutrition-I 1. Measurement of Blood Pressure. 2. Measurement of Body fat. 3. Calculation of BMI (Body Mass Index). 4. Estimation of glucose in blood. 5. Estimation of cholesterol in blood. **b) Advanced Nutritional Biochemistry-I** 1. Preparation of standard solutions. 2. Preparation of buffers using buffer tables and verify pH. 3. Isolation and estimation of casein from milk. 4. Estimation of ascorbic acid in foods. 5. Estimation of calcium, phosphorous and Iron in various food stuffs. 6. Extraction and quantitative estimation of total sugars and reducing sugars from food stuffs. 7. Estimation of proteins in food stuffs. 8. Estimation of activity of alkaline phosphatase in Moong bean seeds. 9. Effect of pH, concentration, time and temperature of incubation on enzyme activity. 10. Estimation of Moisture, ash in the food stuffs.	120

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Suggested Evaluation Methods			
Internal Assessment: 30		**End Term Examination: 70**	
➢ **Practicum**	**30**	➢ **Practicum**	**70**
• Class Participation:	5	Lab record, Viva-Voce, write-up and execution of the practical	
• Seminar/Demonstration/Viva-voce/Lab records etc.:	10		
• Mid-Term Exam:	15		
Part C-Learning Resources			
Recommended Books/e-resources/LMS:			

Session: 2024-25			
Part A–Introduction			
Name of the Programme	M.Sc. Home Science (Food Nutrition and Dietetics)		
Semester	I		
Name of the Course	**Food Science and Food Service Management**		
Course Code	M-23-FND-106		
Course Type	PC-2		
Level of the course	400-499		
Pre-requisite for the course (if any)	B.Sc. Home Science/Any branch of life Sciences or Food/Nutrition/Dietetics as one of the main subject at under graduate level		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Understand the physical and chemical structure of foods and their components. CLO 2: Understand the basic principles and applications of food preservation and food processing CLO 3: Develop skill for quantity cooking and analyze the cost of menu in food service organization. CLO 4: Standardize the recipes for more than 100 persons.		
Credits	Theory	Practical	Total
	0	4	4
Teaching Hours per week	0	8	8
Internal Assessment Marks	0	30	30
End Term Exam Marks	0	70	70
Max. Marks	0	100	100
Examination Time	0	4 hours (or as decided by PGBOS)	

Part B-Contents of the Course

Practicals	Contact Hours
Syllabus/ List of Practical	120

1. **Food Science**

   a) Effect of solutes on boiling point of water.

   b) **Starches, Vegetable Gums and Cereals:** Dextrinization, gelatinization, Factors affecting thickening power of starches, Factors affecting gels. Gluten formation and factors affecting gluten formation.

   c) **Sugar and Jaggery Cookery:** solubility and sizes of sugar, stages of sugar cookery, caramelization, crystallization and factors affecting it.

   d) **Fats and Oils:** Flash point, melting point and smoking point. Role of fats and oils in cookery as: shortening agent, frying medium. Factors affecting fat absorption Permanent and semi-permanent emulsions

   e) **Fruits and Vegetables:** Pigments: Effects of cooking. Effect of various cooking processes on different characteristics of vegetables. Prevention of enzymatic browning.

2. **Pulses:** Effect of various cooking and processing methods on pulses & their products.

3. **Jams and Jellies:** pectin content of fruits, role of acid, pectin and sugar in jam and jelly formation. Use of gums as emulsifiers/

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stabilizers.

4. **Milk and Milk Products:** Scalding, denaturation & coagulation. Millliard reaction. Effect of acid, salt, alkali, sugar, heat, enzymes, polyphenols on milk. Khoa, curd, paneer, cheese (ripened and unripened).
5. **Egg:** Structure, assessing egg quality. Use of egg in cookery: - Emulsions, air incorporation, thickening, binding, gelling. Method of egg cookery and effect of heat. Egg white foams and factors affecting foams.
6. **Meat and Poultry:** Method affecting tenderness of meat, effect of various methods of cooking and ingredients on colour, volume, texture, flavor, aroma and water holding capacity.
7. **Fish and Sea Food:** Effect of different cooking methods on various fish and seafoods.

a) Food Service Management

1. Market survey of Food service equipment.
2. Evaluation of Food Service units-2 Commercial & non-commercial.
3. Layout analysis of Kitchens of different food service Institutions.
4. Analysis of Food safety and Hygiene.
5. Planning menus for quantity.
   -Banquet
   -Outdoor catering
   -Packed meals
   -restaurant
6. Cost analysis of menus in
   - College canteen
   - Hostel mess
   - Hospitals (private, charitable, govt.)

   Standardizing recipes for 100 servings/ persons

Suggested Evaluation Methods			
Internal Assessment: 30		**End Term Examination: 70**	
➢ **Practicum**	**30**	➢ **Practicum**	**70**
• Class Participation:	5	Lab record, Viva-Voce, write-up and execution of the practical	
• Seminar/Demonstration/Viva-voce/Lab records etc.:	10		
• Mid-Term Exam:	15		
Part C-Learning Resources			
Recommended Books/e-resources/LMS:			

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Session: 2024-25	
Name of the Programme	M.Sc. Home Science (Food, Nutrition and Dietetics)
Semester	I
Name of the Course	Seminar
Course Code	M24-FND-107
Course Type: (CC/DEC/PC/Seminar/CHM/OEC/EEC)	Seminar
Level of the course	400-499
Course Learning Outcomes (CLO) After completing this course, the learner will be ableto:	CLO1: To enhance the communication skill of students to express the subject effectively during academic and professional discourse. CLO2: To improve their ability to comprehend and integrate academic text.
Credits	Seminar
	2
Teaching Hours per week	2
Max. Marks	50
Internal Assessment Marks	0
End Term Exam Marks	50
Examination Time	1 hour

Instructions for Examiner: Evaluation of the seminar will be done by the internal examiner(s) on the parameters a
decided by staff council of the department. There will be no external examination/viva-voce examination.

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Session: 2024-25			
Part A – Introduction			
Name of Programme	M.Sc. Home Science (Food, Nutrition and Dietetics)		
Semester	**II**		
Name of the Course	Advanced Human Nutrition- II		
Course Code	M24-FND-201		
Course Type	CC-5		
Level of the course	400-499		
Pre-requisite for the course (if any)	B.Sc. Home Science/Any branch of life Sciences or Food/Nutrition/Dietetics as one of the main subject at under graduate level		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Know about the energy content of food. CLO 2: Determine energy metabolism. CLO 3: Know about body composition, physiology of hunger and various eating disorders. CLO 4: Know about inter-relationship between drugs and various nutrients.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	**1. Energy:** 1.1) Energy content of food stuffs –unit and determination of gross and physiological energy value of food. 1.2) Energy expenditure: factors affecting, components of energy requirement, BMR and factors affecting it. 1.3) Determination of energy metabolism of humans by direct and indirect method. Thermogenesis, Specific Dynamic Action (SDA)	15
II	2. **Water:** 2.2) Water intake and loss, exchange of water in body, effect of low and excess intake of water. 2.3) Electrolyte (Sodium, Potassium and Chloride): Functions, dietary sources, absorption, transport and excretion, water intake and effect of electrolytes on water balance, obligatory water loss, effects of dehydration.	15
III	3. **Body Composition**	15

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	3.1) General body composition, determination of body water, acid-base balance, extra cellular water, cell mass and body fat. 3.2) Change in body composition throughout life, Body mass index: formula to calculate BMI, WHR- waist hip ratio.	
IV	**4. Physiology of Hunger.** 4.1) Theories of Hunger. 4.2) Short term and long term regulation of hunger and food intake **5. Eating disorders** 5.1 Causes and types of eating disorders, behavioural and clinical signs, 5.2 Prevention and treatment of Bulimia, Anorexia Nervosa, Bing eating disorder. **6. Drug-nutrient interaction:** 6.1) Drug use and nutritional status, effects of drugs on food intake, nutrient absorption and metabolism. 6.2) Effects of food on drug absorption, distribution and metabolism.	15
	Total Contact Hours	60

Suggested Evaluation Methods			
Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Modern Nutrition in Health and Disease – Goodhearth, R. S.
2. Recommended dietary allowance for Indian – I.C.M.R., 1980
3. Nutrition and Development- Winick 1973, Univ. of Calombia.
4. Biology of Nutrition – Eclames 1972, Palaniuma Press
5. Foods & Nutrition – Krause 1972, Saunders.
6. Proteins and Human Foods 1970, Lowrie, Avi. Pub. Co.
7. Nut. & Physical fitness-BoGert L.J.
8. Principles of Nut. – Wilson, L.D. and Fisher. K.H.
9. Standardised diets for Hospital – National Nut. Advisory Committee
10. Nutrition in Health & Disease – Cooper, L. Barher, L. Mitehell, Hand Rynheraen.
11. Nutrition A comprehensive: Beaton and McHanery, Treatise Vol-1, II, & III.

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Session: 2024-25			
Part A–Introduction			
Name of Programme	M.Sc. Home Science (Food, Nutrition and Dietetics)		
Semester	II		
Name of the Course	Advanced Nutritional Biochemistry- II		
Course Code	M24-FND-202		
Course Type	CC-6		
Level of the course	400-499		
Pre-requisite for the course (if any)	B.Sc. Home Science/Any branch of life Sciences or Food/Nutrition/Dietetics as one of the main subject at under graduate level		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO1: Acquire an insight into interrelationships among various metabolic pathways. CLO2: Understand the mechanisms adopted by the human body for regulation of metabolic pathways. CLO3: Comprehend the different aspects of molecular biology. CLO4: Know about the mechanism of metabolism of xenobiotics.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	**1. Metabolism of Carbohydrates*-** 1.1) Review of glycolysis, fate of pyruvate: alcoholic and homolactic fermentation, Pasteur effect, Cori cycle. 1.2) Pyruvate dehydrogenase complex and its regulation; Reactions, regulation and amphibolic nature of TCA Cycle; Anaplerotic reactions. 1.3) Hexose monophosphate shunt, Biosynthesis of lactose and sucrose. 1.4) Glycogenesis, glycogenolysis, gluconeogenesis, glyoxylate cycle. Regulation of blood glucose level. **2. Amino Acid Metabolism*-** 2.1) Transamination, deamination and decarboxylation reactions; Role of	15

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	glutamine in ammonia transport. 2.2) Glucose-Alanine Cycle, urea cycle. 2.3) Amino acids as biosynthetic precursors- biosynthesis of heme, biologically active amines and glutathione.	
II	**3. Lipid Metabolism*-** 3.1) Beta-oxidation of saturated and unsaturated fatty acids (including brief account of minor pathways of fatty acid oxidation. 3.2) de novo synthesis of fatty acids. 3.3) Biosynthesis and breakdown of cholesterol, triacylglycerols, Phospholipids, ketone body formation and their utilization, Formation of prostaglandins, prostacyclins, thromboxanes and leukotrienes from arachidonic acid. **4. Biological Oxidation*-** 4.1) Electron transport chain (ETC): components, operation and inhibitors of electron transport chain. 4.2) Oxidative phosphorylation and its mechanism, P/O and P/H ratio, uncouplers.	15
III	5. **Nucleotide Metabolism and Molecular Biology-** 5.1) Biosynthesis and breakdown of purines and pyrimidines. 5.2) DNA replication, transcription, translation (prokaryotes & eukaryotes), regulation of gene expression (Prokaryotes). 5.3) Mutagenesis and DNA repair. 5.4) Recombinant DNA technology and genetically modified foods, nutritional regulation of gene expression. **6. Detoxification-** Metabolism of xenobiotics	15
IV	7. **Enzymology-** 7.1) Mechanism of enzyme action (acid base catalysis, covalent catalysis, metal ion catalysis, electrostatic catalysis, proximity and orientation effect, preferential binding of the transition state complex, strain and distortion theory). 7.2) Enzyme inhibition – irreversible (non-competitive, uncompetitive), reversible(competitive), feedback and product inhibition. 7.3) Regulation of enzyme activity by covalent modification, allosteric modification, isoenzymes. 7.4) Ribozyme and Abzyme, applications of enzymes in medicine and food industry. 8. **Biophysical Techniques-**	15

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	8.1) Chromatography- Column, Thin layer, Paper, Ion exchange, Affinity, Molecular exclusion, GLC and HPLC. 8.2) Electrophoresis- cellulose acetate and gel electrophoresis, isoelectric focusing. 8.3) Spectrophotometry- Bear Lambert's Law, determination and application of extinction coefficient. 8.4) Centrifugation- sedimentation velocity and analytical methods, ultracentrifugation. 8.5) Immunochemical Methods – RIA, ELISA. Uses of Isotopes in biochemistry.	
	Total Contact Hours	60

Suggested Evaluation Methods			
Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Harper's Biochemistry- Robert K. Murray
2. Textbook of Biochemistry- West and Todd
3. Biochemistry – Voet and Voet
4. Principles of Biochemistry – A.L. Lehninger
5. Outlines of Biochemistry- E. E. Conn
6. Biochemistry- Usha Satyanarayan

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Session: 2024-25			
Part A–Introduction			
Name of Programme	M.Sc. Home Science (Food Nutrition and Dietetics)		
Semester	**II**		
Name of the Course	**Clinical Nutrition & Dietetics-I**		
Course Code	M24-FND-203		
Course Type	CC-7		
Level of the course	400-499		
Pre-requisite for the course (if any)	B.Sc. Home Science/Any branch of life Sciences or Food/Nutrition/Dietetics as one of the main subject at under graduate level		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Understand the role of diet in health and disease. CLO 2: Know about the nutritional problems related to various diseases. CLO 3: Gain knowledge about the causative factors, metabolic changes, prevention and nutritional management of various diseases. CLO 4: Understand the principles of diet therapy and nutrient modifications for different diseases.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	1. **Therapeutic modification of the normal diet:** 1.1 Principles of Diet therapy 1.2 Routine Hospital diet 1.3 Diet modifications for therapeutic care 1.4 Enteral and Parenteral nutrition **2. Nutrition in surgical conditions: pre and postoperative.** 2.1 Common surgical conditions- Intestinal obstruction, Bowel obstruction, colostomy & gleostomy. Complications of abdominal surgery.	15
II	3 **Etiology, clinical aberrations, prevention and nutritional management of:** 3.1 Infection- types and stages	15

	3.2 Fever (Acute and chronic) 3.3 Metabolism in fever 3.4 Food Allergy – Types, Common food Allergens and Elimination diets 3.5 Burns- classification, Burns wounds and complications	
III	4 **Nutritional Management in bone and joint diseases:** 4.1 Arthritis 4.2 Osteoarthritis 4.3 Gout 4.4 Rheumatoid arthritis 5 **Etiology, manifestations and dietary management of:** **5.1 Gastro intestinal tract disorders**: Peptic ulcer, Diarrhea, Constipation **5.2 Malabsorption syndrome**: Carbohydrates, Fat and Lactose intolerance, and Celiac disease	15
IV	6. **Etiology, manifestation and dietary management in disorders of** 6.1 Liver- Jaundice (Different types) Hepatitis (Different types) Liver Cirrhosis Hepatic failure 6.2 Pancreas - Pancreatitis (Acute & Chronic) 6.3 Gall Bladder- Cholecystitis or Gall stones	15
Total Contact Hours		60

Suggested Evaluation Methods

Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	70
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1 Sue Rodwell Williams, (1993): Nutrition, Diet Therapy, (7th Ed.): W.B. Saunders Company London

2. Robinson Ch.,M.B.Lawlea, W.L. Chenoweth, and A.E., Carwick: Normal And Therapeutic Nutrition, Macmillan Publishling Company.

3. Mahan L.K., Sylvia Escott-Stump (2000): Krause's Food Nutrition and Diet Therapy 10th Edition, W.B Saunders Company London

4. B. Shrilakshmi, (2007): Dietetics, published by K.K Gupta for New Age International Pvt. Ltd. New Delhi

5. Gopalan C., Ram Sastri B.V. and BalaSubramaniam S.C., (2006) Nutritive Value of Indian Foods, Hydrabad, National Institute of Nutrition, Indian Council of Medical Research

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6. Passmore P. and M.A. East Wood: Human Nutrition and Dietetics. Churchill Living Stone
7. Antia F.P.and Philip Abraham (2001) Clinical Nutrition and Dietetics, Oxford Publishing Company
8. WohlShils and Goodheart: Modern Nutrition in Health and Disease. McLaren and Ubrman. Philadelphia
9. Stanfield S. P. and Hui Y.H: Nutrition and Diet Therapy14th Edition Jones and Barlett Publishers Sudbury, Massachusetts
10. Schlenker D. E. and Roth L.S: William's Essentials of Nutrition and Diet Therapy 10th Edition Elesvier MOSBY

Session: 2024-25			
PartA - Introduction			
Name of Programme	M.Sc. Home Science (Food Nutrition and Dietetics)		
Semester	**II**		
Name of the Course	**Public Health Nutrition-I**		
Course Code	M24-FND-204		
Course Type	CC-8		
Level of the course	400-499		
Pre-requisite for the course (if any)	B.Sc. Home Science/Any branch of life Sciences or Food/Nutrition/Dietetics as one of the main subject at under graduate level.		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: To understand the theory and practice of public health nutrition. CLO 2: To learn the characterization of populations at the greater risk for malnutrition and nutrition related disease, including principal biological, cultural, socioeconomic, and nutritional determinants of diet-related disease risks. CLO 3: To identify the consequences of nutrition problems on public health. CLO 4: Identify various strategies for the prevention and treatment of public health disorders.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	**1. Introduction to Public Health Nutrition** 1.1 Aim, Scope and content of Public Health Nutrition 1.2 Role of Public Health Nutritionist in National Development **2. Prevalence, etiology, biochemical &clinical manifestation and preventive measures for:** 2.1 Protein calories Malnutrition 2.2 Beri-beri 2.3 Scurvy	20
II	**3. Prevalence, etiology, biochemical &clinical manifestation and preventive measures for:** 3.1 Vitamin A deficiency	15

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	3.2 Iodine deficiency 3.3 Pellagra	
III	**4. Prevalence, etiology, biochemical &clinical manifestation and preventive measures for:** 4.1 Nutritional Anemia 4.2 Fluorine Deficiency and Toxicity	15
IV	**5. Prevalence, etiology, biochemical &clinical manifestation and preventive measures for:** 5.1 Rickets 5.2 Osteomalacia 5.3 Osteoporosis	10
Total Contact Hours		60

Suggested Evaluation Methods

Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Modern Nutrition in Health and Disease – Goodhearth, R. S.
2. Recommended dietary allowance for Indian – I.C.M.R., 2017
3. Nutrition and Development- Winick 1973, Univ. of Colombia.
4. Biology of Nutrition – Eclames 1972, Palaniuma Press
5. Foods & Nutrition – Krause 1972, Saunders.
6. Proteins and Human Foods 1970, Lowrie, Avi. Pub. Co.
7. Nut. & Physicalfitness-BoGert L.J.
8. Principles of Nut. – Wilson, L.D. and Fisher. K.H.
9. Standardised diets for Hospital – National Nut. Advisory Committee
10. Nutrition in Health & Disease – Cooper, L. Barher, L. Mitchell, HandRynheraen.
11. Nutrition A comprehensive: Beaton and McHanery, Treatise Vol-1, II, & III.
12. Human Nut. & Dietectics- Davidson S., Passmore, R., Brook, J.E. and Truswell.
13. Foods and Nut.- Rankin, W. Munn. Hildath E.N.
14. Iron deficiency – Holiberth, H.C. Harvorth, vannotti, N.Y.
15. Public Health Nutrition in Developing Countries- Sheila Chander Vir

Session: 2024-25			
Part A–Introduction			
Name of the Programme	PG Home Science (Food, Nutrition and Dietetics)		
Semester	II		
Name of the Course	Advanced Human Nutrition and Advanced Nutritional Biochemistry-II		
Course Code	M24-FND-205		
Course Type	PC-3		
Level of the course	400-499		
Pre-requisite for the course (if any)			
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Analyse different parameters of blood/ serum. CLO 2: Assess food intake of individuals. CLO3: Calculate the amount of sodium and potassium in various foods/ drinks. CLO4: Apply the biophysical techniques for estimation of amino acids and proteins.		
Credits	Theory	Practical	Total
	0	4	4
Teaching Hours per week	0	8	8
Internal Assessment Marks	0	30	30
End Term Exam Marks	0	70	70
Max. Marks	0	100	100
Examination Time	0	4 hours (or as decided by PGBOS)	

Part B-Contents of the Course

Practicals	Contact Hours
a) **Advanced Human Nutrition-II** 1. Determination of iodine value of given fat sample. 2. Estimation of haemoglobin and RBC. 3. Identification of Blood groups. 4. Assessment of food intake. b) **Advanced Nutritional Biochemistry-II** 1. **Calcium:** Estimation of calcium in serum. 2. **Phosphorus:** Estimation of inorganic phosphorus in serum. 3. **Protein**: Estimation of albumin, globulin and albumin/globulin ratio in serum. 4. **Enzyme assay:** Estimation of activity of serum alkaline phosphatase and transaminase. 5. **Urea and Creatinine:** Estimation of urea and creatinine in serum. 6. **Minerals:** Determination of Sodium & Potassium of food /drinks using Flame Photometer. 7. Separation of amino acids by paper chromatography, TLC. 8. Separation of proteins by gel electrophoresis.	120

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Suggested Evaluation Methods			
Internal Assessment: 30		**End Term Examination: 70**	
➢ **Practicum**	30	➢ **Practicum**	70
• Class Participation:	5	Lab record, Viva-Voce, write-up and execution of the practical	
• Seminar/Demonstration/Viva-voce/Lab records etc.:	10		
• Mid-Term Exam:	15		
Part C-Learning Resources			
Recommended Books/e-resources/LMS:			

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Session: 2024-25			
Part A–Introduction			
Name of the Programme	M.Sc. Home Science (Food Nutrition and Dietetics)		
Semester	**II**		
Name of the Course	Clinical Nutrition & Dietetics and Public Health Nutrition		
Course Code	M-24-FND-206		
Course Type	PC-4		
Level of the course	400-499		
Pre-requisite for the course (if any)			
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Plan, calculate and prepare therapeutic diets for various disorders. CLO 2: Know about commercial nutritional supplements available in market. CLO 3: Develop skills in preparing teaching aids for the diagnosis of different diseases. CLO 4: Develop low-cost standardized recipes for different age groups and able to prepare cyclic menus for feeding programmes and institutions.		
Credits	Theory	Practical	Total
	0	4	4
Teaching Hours per week	0	8	8
Internal Assessment Marks	0	30	30
End Term Exam Marks	0	70	70
Max. Marks	0	100	100
Examination Time	0	4 hours (or as decided by PGBOS)	

Part B-Contents of the Course

Practicals	Contact Hours
Syllabus/ List of Practical	120
1. Clinical Nutrition & Dietetics 1.1 Planning, Calculation, Preparation, serving and evaluation of therapeutic diets for diseases covered in theory. 1.2 Preparation of diet counseling aids for common disorders. 1.3 Market survey of the following products: • Food Supplements • External formulas • Disease specific foods **2. Public Health Nutrition** 2.1 Development and standardization of low-cost nutritious recipes based on locally available food and better quality. 2.2 Development and standardization of low-cost nutritive recipes suitable for various vulnerable groups. 2.3 Field experience in operational public nutrition programmes: nutrition rehabilitation centers, fortification programmes and cost	

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Suggested Evaluation Methods			
Internal Assessment: 30		**End Term Examination: 70**	
➢ **Practicum**	**30**	➢ **Practicum**	**70**
• Class Participation:	5	Lab record, Viva-Voce, write-up and execution of the practical	
• Seminar/Demonstration/Viva-voce/Lab records etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Gopalan C., Ram Sastri B.V. and BalaSubramaniam S.C., (2006) Nutritive Value of Indian Foods. Hydrabad, National Institute of Nutrition, Indian Council of Medical Research

2. Longvah T., Ananthan R., Bhaskarachary K. and Venkaiah K. (2017): Indian Food Composition Tables, National Institute of Nutrition, Indian Council of Medical Research, Hydrabad, Telangana (India)

3. Nutrient Requirements for Indians, Recommended Dietary Allowances And Estimated Average Requirements-2020, ICMR-NIN

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Session: 2024-25			
Part A - Introduction			
Name of the Programme	Common to all PG Programmes		
Semester	II		
Name of the Course	Constitutional, Human and Moral Values, and IPR		
Course Code	M24-CHM-201		
Course Type	CHM		
Level of the course	400-499		
Pre-requisite for the course (if any)	-		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO-1: Learn the different Constitutional Values, Fundamental rights and duties enshrined in the India Constitution. CLO-2: Understand humanism, human virtues and values, and idea of International peace. CLO-3: Grasp the basic concepts of Moral Values and Professional Conduct which are required to become a part of the civil society and for developing professionalism. CLO-4: Understand concepts of Intellectual Property Rights, Copyright, Patent, Trademark etc., and about threats of Plagiarism.		
Credits	Theory	Practical	Total
	2	0	2
Teaching Hours per week	2	0	2
Internal Assessment Marks	15	0	15
End Term Exam Marks	35	0	35
Max. Marks	50	0	50
Examination Time	3 hours		
Part B-Contents of the Course			
Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.			

Unit	Topics	Contact Hours
I	**Constitutional Values:** Historical Perspective of Indian Constitution; Basic Values enshrined in the Preamble of the Indian Constitution; Concept of Constitutional Morality; Patriotic Values and Ingredients Nation Building; Fundamental Rights and Duties ; Directive Principles of the State Policy.	8
II	**Humanistic Values:** Humanism, Human Virtues and Civic Sense; Social Responsibilities of Human Beings; Ethical ways to deal with human aspirations; Harmony with society and nature; Idea of International Peace and Brotherhood (Vasudhaiv Kutumbkam).	7
III	**Moral Values and Professional Conduct** Understanding Morality and Moral Values; Moral Education and Character Building; Ethics of Relations: Personal, Social and Professional; Introduction to Gender Sensitization; Affirmative approach	8

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	towards Weaker Sections (SCs, STs, OBCs, EWS& DAs); Ethical Conduct in Higher Education Institutions; Professional Ethics.	
IV	**Intellectual Property Rights:** Meaning, Origins and Nature of Intellectual Property Rights (IPRs);Different Kinds of IPRs – Copyright, Patent, Trademark, Trade Secret/Dress, Design, Traditional Knowledge; Infringement and Offences of IPRs – Remedies and Penalties; Basics of Plagiarism policy of UGC.	7
	Note: Scope of the syllabus shall be restricted to generic and introductory level of mentioned topics.	
	Total Contact Hours	30

Suggested Evaluation Methods

Internal Assessment: 15		**End Term Examination: 35**	
➢ **Theory**	**15**	➢ **Theory**	**35**
• Class Participation:	4	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	4		
• Mid-Term Exam:	7		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

Ahuja, V K. (2017). *Law relating to Intellectual Property Rights*. India, IN: Lexis Nexis.

Bajpai, B. L., *Indian Ethos and Modern Management*, New Royal Book Co., Lucknow, 2004.

Basu, D.D., *Introduction to the Constitution of India* (Students Edition) Prentice Hall of India Pvt. Ltd., New Delhi, 20th ed., 2008.

Dhar, P.L. & R.R. Gaur, *Science and Humanism*, Commonwealth Publishers, New Delhi, 1990.

George, Sussan, *How the Other Half Dies*, Penguin Press, 1976.

Govindarajan, M., S. Natarajan, V.S. Sendilkumar (eds.), *Engineering Ethics (Including Human Values)*, Prentice Hall of India Private Ltd, New Delhi, 2004.

Harries, Charles E., Michael S. Pritchard & Michael J. Robins, *Engineering Ethics*, Thompson Asia, New Delhi, 2003.

Illich, Ivan, *Energy & Equity*, Trinity Press, Worcester, 1974.

Meadows, Donella H., Dennis L. Meadows, Jorgen Randers & William W. Behrens, *Limits to Growth: Club of Rome's Report*, Universe Books, 1972.

Myneni, S.R, Law of Intellectual Property, Asian Law House.

Narayanan, P, *IPRs*.

Neeraj, P., &Khusdeep, D. (2014). *Intellectual Property Rights*. India, IN: PHI learning Private Limited.

Nithyananda, K V. (2019). *Intellectual Property Rights: Protectionand Management*. India, IN: Cengage Learning India PrivateLimited.

Palekar, Subhas, *How to practice Natural Farming*, Pracheen (Vaidik) KrishiTantraShodh, Amravati, 2000.

Phaneesh, K.R., *Constitution of India and Professional Ethics*, New Delhi.

Pylee, M.V., *An Introduction to Constitution of India*, Vikas Publishing, New Delhi, 2002.

Raman, B.S., *Constitution of India*, New Delhi, 2002.

Reddy, B., Intellectual Property Rights and the Law, Gogia Law Agency.

Reddy, N.H., SantoshAjmera, *Ethics, Integrity and Aptitude*, McGraw Hill, New Delhi.

Sharma, Brij Kishore, *Introduction to the Constitution of India*, New Delhi.

Schumacher, E.F., *Small is Beautiful: A Study of Economics as if People Mattered*, Blond & Briggs, Britain, 1973.

Singles, Shubham et. al., *Constitution of India and Professional Ethics*, Cengage Learning India Pvt. Ltd., Latest Edition, New Delhi, 2018.

Tripathy, A.N., *Human Values*, New Age International Publishers, New Delhi, 2003.

Wadehra, B.L., Law relating to Intellectual Property, Universal Law Publishing Co.

Relevant Websites, Movies and Documentaries:

Value Education Websites, http://uhv.ac.in, http://www.uptu.ac.in.

Story of Stuff, http://www.storyofstuff.com

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Cell for IPR Promotion and Management: http://cipam.gov.in/.
World Intellectual Property Organization: https://www.wipo.int/about-ip/en/
Office of the Controller General of Patents. Designs & Trademarks: http://www.ipindia.nic.in/
Al Gore, *An Inconvenient Truth*. Paramount Classics, USA.
Charlie Chaplin. *Modern Times*. United Artists, USA.
Modern Technology – The Untold Story. IIT, Delhi.
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