SYLLABUS

M.Sc. HOME SCIENCE
(FOOD AND NUTRITION)

CHOICE BASED CREDIT SYSTEM (CBCS)

ACCORDING TO NEW EDUCATION POLICY 2020

(Effective from 2024-25)

Chaudhary Charan Singh University, Meerut

(Formerly, Meerut University)

NAAC A++ Accredited

Department of Home Science
Chaudhary Charan Singh University, Meerut

Department of Home Science

Chaudhary Charan Singh University, Meerut

M.Sc. Home Science (Food and Nutrition) - Syllabus

Structure of Course according to NEP – 2020 (Common Minimum Pattern)

Semester	Major Course	Minor Course	Industrial Training/Survey /Research	Minimum credit for the year	Minimum credit for Diploma/Degree obtained
VII	Th 4 (4) + PR 1 (4) / Th 3 (4) + PR 2 (4)	1 (4/5/6)	1 (4)	52	(184) Bachelor in Research in Faculty
VIII	Th 4 (4) + PR 1 (4) / Th 3 (4) + PR 2 (4)		1 (4)		
IX	Th 4 (4) + PR 1 (4) / Th 3 (4) + PR 2 (4)	-	1 (4)	48	(232) Master in Faculty
X	Th 4 (4) + PR 1 (4) / Th 3 (4) + PR 2 (4)		1 (4)		

Convenor (II) BOS
Home Science
R.G.P.G. College, Meerut

INTRODUCTION: The Department of Home Science offers M.Sc. Food and Nutrition. The programme endeavours to train a cadre of professionals who can create nutrition awareness for promotion of healthy lifestyle among the population. The courses of this programme have been designed to enhance the core competency of students in the fields of public health nutrition, dietetics and food science. The curriculum provides a strong theoretical base and also includes experiential learning through field placements and practicals. The programme aims to strengthen the research insight of students so as to enable them to develop into academicians and researchers in the field of food science and nutrition.

PROGRAMME SPECIFIC OBJECTIVES: The objectives of M.Sc. Food and Nutrition programme are:

- To impart the understanding of the concepts of biochemistry, food chemistry and food microbiology
- To enable the students to learn the methods of assessing human nutritional requirements, nutritional assessment and diet planning
- To apply theoretical concepts in laboratory setting areas
- To understand the applications of nutritional sciences in clinical interventions

PROGRAMME SPECIFIC OUTCOMES: The programme trains students to become professionals who can work as public health nutritionists, dieticians and food scientists. After completing this programme, the student will be able to:

- Assess nutritional status and plan appropriate diets.
- Use the knowledge of nutritional sciences in clinical interventions and communication for health promotion
- Work as program planners and managers in the field of public health nutrition
- Work as food scientists, quality assurance managers and analysts.
- Manage a food service establishment
- Apply theoretical concepts and practical training for research in the field of food science, clinical nutrition and public health nutrition

APPLICABILITY:- This syllabus shall apply from the session 2024-25.

MINIMUM ELIGIBILITY FOR ADMISSION:- Any graduate from B.Sc. Home Science/ Community Science/ B.Sc. (Clinical Nutrition and Dietetics)/ B.Sc. Food Science & Quality Control from a UGC recognized University/ Institute shall be eligible for admission in the course

SEMESTER-WISE TITLES OF PAPERS IN M.Sc. HOME SCIENCE (FOODS AND NUTRITION)

YEAR	SEM.	COURSE CODE	CORE COMPULSORY/ ELECTIVE/ VALUE ADDED	PAPER TITLE	THEORY /PRACTICAL	CREDITS
4	VII		Compulsory	Human Physiology	Theory	4
4	VII		Compulsory	Principles of Food Science	Theory	4
4	VII		Compulsory	Food Science Practical	Practical	4
4	VII		Compulsory	Nutritional Biochemistry & Techniques	Theory	4
4	VII		Compulsory	Nutritional Biochemistry & Techniques-I Practical	Practical	4
4	VII/VIII		Compulsory	One Minor From Other Faculty	Theory	4
4	VII		Compulsory	Research Project *(Formulating a research proposal, title finalization, review of literature)*	Project	4
					TOTAL CREDITS	**24/28**
4	VIII		Compulsory	Advanced Human Nutrition	Theory	4
4	VIII		Compulsory	Food Microbiology & Food Safety	Theory	4
4	VIII		Compulsory	Integrated Practical (Human Nutrition & Food Microbiology)	Practical	4
4	VIII		Compulsory	Advanced Nutritional Biochemistry & Techniques	Theory	4
4	VIII		Compulsory	Advanced Nutritional Biochemistry & Techniques Practical	Practical	4
4	VIII		Compulsory	Research Project *(Sampling, data collection, data entry)*	Project	4

					TOTAL CREDITS	24/28
5	IX		Compulsory	Community & Public Health Nutrition	Theory	4
5	IX		Compulsory	Clinical Nutrition	Theory	4
5	IX		Compulsory	Clinical Nutrition Practical	Practical	4
5	IX		Compulsory	Institutional Food Service Management	Theory	4
5	IX		Compulsory	Institutional Food Service Management Practical	Practical	4
5	IX		Compulsory	Research Project *(Statistical analysis & Results)*	Project	4
					TOTAL CREDITS	**24**
			Choose between group A or group B in Semester X			
5	X		**GROUP A**	1) Advanced Clinical Nutrition 2) Nutrition Communication and Diet Counseling 3) Nutrition for Fitness and Sports 4) Advanced Clinical Nutrition Practical 5) Nutrition Communication & Diet Counseling Practical	Theory Theory Theory Practical Practical	4 4 4 4 4
5	X		**GROUP B**	1) Problems, Policies and Programmes in Public Health Nutrition 2) Nutritional Epidemiology 3) Nutrition	Theory Theory Theory	4 4

				Communication for Health Promotion 4) Problems, policies & programmes in Public Health Nutrition Practical 5) Nutrition Communication Methods Practical	Practical Practical	4 4 4
5	X		Compulsory	6) Dissertation / Industrial Internship – *(Final report writing & seminar presentation)*	PROJECT	4
					TOTAL CREDITS	**24**

IMPORTANT INSTRUCTIONS ABOUT THE COURSE

1. **Maximum marks in all the course will be 100, and it will split as External Assessment of 70 marks and Internal Assessment of 30 marks. Minimum Passing marks in each course is 36**
2. The theory and practical courses of each major and minor subject have a total credit score of 100. Their passing percentage is 36. The Major Research Project are also credit courses of total 100 marks and the passing percentage is 36.
3. The calculation of marks out of maximum 100 in the theory and practical papers of major and minor subjects will be done by adding the marks obtained in continuous assessment of 30 marks and university external examination of 70 marks.
4. There are two rules to pass theory and practical of every course/paper of main and minor subjects-
    - **A.** It will be necessary to get **minimum 21 marks out of maximum 70 marks in university examination** i.e. 30% of 70 and **minimum 9 marks out of maximum 30 marks** i.e. 30% of 30 in internal assessment separately.

B. Minimum 36 marks out of 100 in total in internal and external examinations will have to be obtained.

5. Only after passing in internal assessment, the student will be allowed to give external examination of that course or paper in the university.
6. No grace marks of any kind will be given.
7. It will be necessary to get minimum 4.0 CGPA for graduation with research or post-graduation degree.

Important Note- Only one External examiner shall be appointed for all practical examinations in each semester. It is mandatory that the appointment of examiner should be from any field of home science only

SEMESTER VII

PAPER I: HUMAN PHYSIOLOGY

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: IV	Semester: VII
Subject: Home Science		
Course Code:	**Course Title: HUMAN PHYSIOLOGY**	Theory

Course Objectives: To understand the normal functioning of various organ systems of the body and their interactions and to be able to comprehend the pathophysiology of commonly occurring diseases.

Course outcomes:

- Understand the current state of knowledge about the functional organization of the human body.
- Develop insight of normal functioning of all the organ systems of the body and their interactions.
- Comprehend the pathophysiology of commonly occurring diseases.

  Correlate physiology with various disorders and their pathogenesis.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60 (1 hour per lecture)

Unit	Topic	No. of Lectures
I	**Basic human Anatomy and Physiology** • Definition of anatomy and physiology • Cell structure and functions, organelles, tissues and organs	12
II	**Blood and Cardio-Thoracic Physiology** • Blood and Plasma Protein -Composition and Function • Blood formation and factors controlling Erythropoiesis. • Pathophysiology of Anaemia and Jaundice • Cardiac cycle, Cardiac output, Heart sounds • E.C.G. & its interpretation, Heart rate & regulation	12

	• Blood pressure, Hypertension • Coronary Artery Disease • Hemorrhage; Compensatory changes after hemorrhage • Transport and exchange of gases • Control of Respiration and Respiratory function tests • Lung volume & Capacities and COPD	
III	**Excretory Physiology and Exercise Physiology** • Urine formation • Renal function tests • Acid Base balance • Pathophysiology of Renal Stones, Urinary Tract Infection, Glomerulonephritis • Concept of Fitness, Adaptations to exercise • Energy Metabolism in Sports • Overview of Diet and Physical Performance	12
IV	**Gastrointestinal Physiology** • Functions of Stomach, Liver, Pancreas and Gall Bladder • Composition, function and regulation of Salivary juice, Gastric juice, Pancreatic juice, Bile juice, Intestinal juice • GI hormones • Pathophysiological overview of some common diseases in relation to Gastrointestinal Tract (Peptic ulcer/GERD, Cholelithiasis, Portal Hypertension, Fatty liver and Liver Cirrhosis.	12
V	**Neuro-Endocrine and Reproductive Physiology** • Overview of organization of nervous system • Effects of Pituitary, Thyroid, Parathyroid, Adrenal and Pancreatic hormones • Pathophysiology of Diabetes Mellitus, Metabolic Syndrome, Hashimoto's disease. Tetany and Cushing Syndrome • Physiology of Menstruation and Menopause • Physiology of Ageing • Physiology of Pregnancy, Lactation • Pathophysiology of PCOD and Infertility	12
Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.		

Suggested Readings:

• Ganong W.F.(2003)-Review of Medical Physiology.21st ed. McGraw Hill.

• Guyton A.C. and Hall J.E.(2000)Textbook of Medical Physiology.10th ed. India: Harcourt Asia..

• Tortora G.J and Grabowski S.R.(2000) Principles of Anatomy and Physiology.9th ed. John Wiley and Sons.Inc.

• West J.B.(1996): Physiological Basis of Medical Practice.12th Edition. B. I. Waverly Pvt. Ltd.

• Marieb E.N(2001) Human Anatomy and Physiology (5th ed) Pearson Education, Inc, publishing as Benjamin Cummings.

• Jain A. K (2014) Human Physiology for BDS (5th Edition), Publisher: Avichal Publishing Company; ISBN 9788177394337 .

• Pal G.K and Pal Pravati (2016) Comprehensive Textbook Of Medical Physiology (2Vols) Publisher: Jaypee Brothers Medical Pub (P) Ltd.) ISBN: 5551234080758

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses:
https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx

PAPER II: PRINCIPLES OF FOOD SCIENCE

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: IV	Semester: VII
Subject: Home Science		
Course Code:	**Course Title: PRINCIPLES OF FOOD SCIENCE**	Theory

Course Objectives: The objective of the "Principles of Food Science" course is to provide students with a comprehensive understanding of the fundamental principles and concepts related to food science

Course outcome

- To identify and describe key components of food.
- To **e**xplain chemical reactions in food processing and storage.
- To control microbial growth in food production and enhance food safety and shelf life.
- To apply food safety regulations and standards.

Credits:4		Core Compulsory
Max. Marks: 30+70=100		Min. Passing Marks : 36
Total No. of Lectures – 60 (1 hour per lecture)		
Unit	**Topic**	**No. of Lectures**
I	**Physical & Physiological changes in food.** a) Colloidal Chemistry as related to food emulsions, foams, sols & gels,osmotic pressure. b) Enzymatic browning, enzymes in Food Processing c) Denaturation of Protein.	12
II	**Cereal and Cereal Products** a) Cereal grains, structure & composition , Cereal products, Breakfast Cereals. - Leavening agents and products. b) **Sugar and Sugar Products** - Manufacturing Process of Sugar Stages of sugar Cookery. c) **Starch-** Structure, gelatinization, Modified Food Starches. d) **Fruits & Vegetables**: -Pigments and colour in Food.	12
III	**a)Milk & Milk Products**: - Composition and properties of milk. -Dairy Products: Cultured milk, Yoghurt, butter, Whey, cheese etc. b) **Meat, Poultry & Egg:** - postmortem changes in meat, tenderizing meat, heat induced changes in meat, meat substitutes. - Egg: Structure & composition , changes during storage, functional properties of egg, egg substitutes.	12
IV	**Food Additives** a) Meaning, need of food additives. b) Antioxidants, chelating agents, coloring agents, curing agents. c) Nutrient supplements, Non-nutritive sweeteners, pH control agents. d) Preservatives, stabilizers and thickeners, Other Additives. e) Additives & Food Safety.	12
V	**Sensory evaluation** –Definition, meaning and various tests used in Sensory evaluation & food product development.	12
Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.		

Suggested Readings:

- Branen AL, Davidson PM & Salminen S. (2001) Food Additives. 2nd Ed. Marcel Dekker.
- Fellows P J (2002) Food Processing Technology- Principles and Practices, 2nd Edition. Woodhead Publishing Ltd.
- Food and Agriculture Organization. (1980) Manual of Food Quality Control. Additive Contaminants Techniques. Rome.
- Fuller, G.W. (1999) New Food Product Development. From concept to market place. CRC press, New York.
- Mahindru, S N (2000) Food Additives- Characteristics Detection and Estimation. Tata Mc Graw Hill Publishing Co. Ltd.
- Peter Murano , Understanding Food Science and Technology (with InfoTrac) 1st
- BIS standards for food products and analysis manual.
- Manuals of methods of analysis of various food products, FSSAI, 2016.

This course can be opted as an elective/ value-added course by the students of the following subjects:
Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses:
https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx

PAPER III FOOD SCIENCE

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: IV	Semester: VII
Subject: Home Science		
Course Code:	**Course Title: FOOD SCIENCE**	Practical

Course Objectives: The objective of the practical component of the "Principles of Food Science" course is to provide students with hands-on experience and skills essential for applying theoretical knowledge in real-world scenarios

- **Course outcome:**
- Perform accurate chemical analysis to determine the composition of food items.
- Identify and quantify microorganisms in food samples to assess and ensure food safety.
- Operate equipment and perform various food processing and preservation techniques effectively.
- Conduct sensory evaluations to assess the texture, flavor, color, and overall acceptability of food products.
- Test and evaluate different packaging materials and methods for their effectiveness in preserving food quality.
- Apply and monitor proper food safety and hygiene practices in laboratory settings.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60 (2 hours per lecture)

Unit	Topic	No. of Lectures
I	Proximate composition of foods: Analysis of carbohydrates, proteins, fats, total ash, moisture content, active alcoholic and aqueous acidity in foods, ascorbic acid/dehydroascorbic acid ratio in foods.	10
II	Estimation of sugar in foods and reducing properties in honey.	10
III	Refractive index, melting point, solidification point of fats & oils.	10

IV	Determination of peroxide value and acid value in fats & oils.	10
V	Estimation of polyphenols in foods.	10
VI	Analysis of food ingredients and additives.	10

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses:
https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx

PAPER IV NUTRITIONAL BIOCHEMISTRY AND TECHNIQUES

Programme /Class : M.Sc FOOD & NUTRITION (NEP)	Year: IV	Semester: VII
Subject: Home Science		
Course Code:	**Course Title: NUTRITIONAL BIOCHEMISTRY AND TECHNIQUES**	Theory

Course Objectives: The objective of the "Nutritional Biochemistry and Techniques" course is to provide students with a deep understanding of the biochemical processes related to nutrition and the techniques used to analyze and evaluate nutritional status

Course outcome

- Explain metabolic pathways for carbohydrates, proteins, lipids, vitamins, and minerals.
- Describe biochemical mechanisms of common nutritional disorders and diseases.
- Understand digestion, absorption, and transportation of nutrients.
- Explain energy production and expenditure pathways.
- Understand how diet affects gene expression and genetic impacts on metabolism.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36
Total No. of Lectures – 60 (1 hour per lecture)	

Unit	Topic	No. of Lectures
I	**Enzymes** • Classification of enzymes, Cofactor & Prosthetic groups, Concept of active site. • Effect of pH, temperature, substrate concentration (Km and Vmax, Michaelis-Menten equation) & metal ions on enzyme activity • Isozyme and Ribozyme • Application of enzymes in diagnostics (SGPT, SGOT, Creatine kinase & Alkaline phosphatase)	12
II	**Carbohydrates** • Metabolic regulation of glycolysis, gluconeogenesis, citric acid cycle and glycogen metabolism. • Pentose phosphate pathway and its significance • Disorders of carbohydrate metabolism: galactosemia, hereditary fructose intolerance, fructosuria and Glycogen storage disease (Von Gierke, Pompe, Cori and McArdle diseases)	12
III	**Lipids** • Fatty acids – Synthesis of saturated and unsaturated fatty acids • Triacylglycerols – Synthesis • Phospholipids – Synthesis • Lipoproteins – Types, synthesis, degradation and clinical significance • Cholesterol – Synthesis and regulation • Integration of carbohydrate and lipid metabolism	12
IV	**Biosignaling and Hormones** • Concept of Hormones • Six types of signaling mechanisms • Role of insulin, glucagon & epinephrine in intracellular signaling • Steroid hormones	12
V	**Spectrophotometric Techniques** • Beer-Lambert's law • Colorimetry and spectrophotometry • Atomic absorption spectroscopy • Flame photometry	12

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Readings: :

- Berg JM, Stryer L, Tymoczko JL and Gatto GJ. (2015) Biochemistry 8 th ed. W.H. Freeman.
- Devlin TM. (2010) Text Book of biochemistry with Clinical Correlations 7 th ed. John Wiley and Sons.
- Rodwell VW, Bender DA, Botham KM, Kennelly PJ and Weil PA. (2015) Harper's Illustrated Biochemistry. 30th ed. McGraw-Hill. Asia.
- Nelson DL and Cox MM. (2017) Principles of Biochemistry. 7th ed. W.H. Freeman.
- Wilson K and Walker J. (2000) Practical Biochemistry. 5 th ed. Cambridge University Press

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all
Suggested Continuous Evaluation Methods: • Seminar/ Presentation on any topic of the above syllabus • Internal assessment/tests • Attendance
Suggested equivalent online courses: https://epgp.inflibnet.ac.in/ https://swayam.gov.in/ https://heecontent.upsdc.gov.in/Home.aspx

PAPER V: NUTRITIONAL BIOCHEMISTRY AND TECHNIQUES – I

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: IV	Semester: VII
Subject: Home Science		
Course Code:	**Course Title: NUTRITIONAL BIOCHEMISTRY AND TECHNIQUES – I**	Practical

Course Objectives: The objective of the practical component of the "Nutritional Biochemistry and Techniques" course is to provide students with hands-on experience in applying biochemical techniques to analyze and understand nutritional processes

Course outcome

- Accurately measure the concentration of nutrients, metabolites, and biomarkers in various biological samples.
- Proficiently operate spectrophotometers, chromatographs, and electrophoresis apparatus for biochemical analyses.
- Effectively utilize PCR, Western blotting, and ELISA techniques to study nutrient-gene interactions and protein expression.
- Investigate and interpret the biochemical pathways of nutrient metabolism through hands-on experiment
- Assess nutritional status by analyzing blood, urine, and tissue samples for nutrient and metabolite levels.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36
Total No. of Lectures – 60 (2 hours per lecture)	

Unit	Topic	No. of Lectures
I	**Solutions** • Preparation of normal and molar solutions.	20
II	**Spectrophotometry** • Estimation of Phosphorous • Estimation of Proteins. • Estimation of Iron. • Estimation of Cholesterol. • Estimation of glucose	20
III	**Enzyme Assays** • Assay of salivary amylase • Assay of alkaline phosphatase	20
Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.		
Suggested Readings: • Plummer D. T. (2015). An Introduction to Practical Biochemistry. 3rd ed., Tata McGraw Hill • Wilson K and Walker J. (2000) Practical Biochemistry5th ed. Cambridge University		
This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all		
Suggested Continuous Evaluation Methods: • Seminar/ Presentation on any topic of the above syllabus • Internal assessment/tests • Attendance		
Suggested equivalent online courses: https://epgp.inflibnet.ac.in/ https://swayam.gov.in/ https://heecontent.upsdc.gov.in/Home.aspx		

SEMESTER VIII

PAPER I : ADVANCED HUMAN NUTRITION –I

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: IV	Semester: VIII
Subject: Home Science		
Course Code:	**Course Title: ADVANCED HUMAN NUTRITION –I**	Theory

Course Objectives: The objective of the "Human Nutrition" course is to provide students with a comprehensive understanding of the principles and applications of nutrition in human health and disease

Course outcome

- Explain essential nutrients, their sources, functions, and recommended intakes for human health.
- Describe the digestion, absorption, and metabolism of carbohydrates, proteins, and fats, and their roles in energy production and body function.
- Discuss the roles of vitamins and minerals in maintaining physiological functions and preventing deficiencies.
- Explain biochemical processes related to nutrient metabolism and their implications for health.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60 (1 hour per lecture)

Unit	Topic	No. of Lectures

I	Human Nutrient Requirements - Micronutrients -Critical evaluation of sensitive methods and derivations of requirements and dietary allowances of micronutrients for all age groups: • Water soluble vitamins • Fat soluble vitamins • Minerals and trace elements • Critical evaluation of national and international nutrient allowances; factors affecting the requirements. • Critically evaluate national and international dietary guidelines.	12
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 and to infections. • Operational implications.	12
III	Nutrition in Special Conditions • Extreme temperatures - low and high • High altitude • Space nutrition and food systems • Introduction to sports nutrition	12
IV	Emerging Concepts in Human Nutrition • Nutrigenomics • Functional foods and bioactive compounds • Nutraceuticals • Genetically modified foods and advances in biotechnology	12
V	Nutrition in emergencies	12

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Readings:

• Bamji, M.S., Krishnaswamy K. Brahmam G.N.V. (Eds.) (2017). Textbook of Human Nutrition. 4th Edition. New Delhi : Oxford and IBH Publishing Co. Pvt. Ltd. Department of Home Science, University of Delhi 50

• Chadha R., Mathur P. (Eds.) (2015). Nutrition: A Lifecycle Approach. New Delhi: Orient Blackswan

• FAO/WHO. (2004). Vitamin and Mineral Requirements in Human Nutrition. Report of a Joint Expert Consultation.

• FSSAI (2016). Food Safety and Standards (Food or Health Supplements, Nutraceuticals, Foods for Special Dietary Uses, Foods for Special Medical Purpose, Functional Foods and Novel Food) Regulations. http://www.fssai.gov.in/home/fss-legislation/fssregulations.html

• ICMR (2010). Nutrient Requirements and SUGGESTED Dietary Allowances for Indians and its revised documents. New Delhi. ICMR.

• Simopoulos A.P., Ordovas J.M. (Eds.) (2004). Nutrigenetics and Nutrigenomics. USA: Karger

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses:
https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx

PAPER II FOOD MICROBIOLOGY AND FOOD SAFETY

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: IV	Semester: VIII
Subject: Home Science		
Course Code:	**Course Title: FOOD MICROBIOLOGY AND FOOD SAFETY**	Theory

Course Objectives:

The objective of the "Food Microbiology and Food Safety" course is to provide students with a thorough understanding of microbiological aspects related to food safety and quality.

Course outcome:

- Describe the diversity, growth requirements, and activities of microorganisms in food.
- Recognize common foodborne pathogens, their sources, transmission routes, and infection mechanisms.
- Identify causes and indicators of food spoilage by microorganisms and methods to prevent it.
- Implement various food preservation methods to maintain food safety and quality.
- Apply hazard analysis and critical control points (HACCP) to identify and manage food safety risks.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60 (1 hour per lecture)

Unit	Topic	No. of Lectures
I	**Basic Microbiology** • Introduction to microbiology • Characteristics of microorganisms • Factors effecting microbial growth	12
II	**Food Spoilage and Preservation** • Cultivation of micro-organisms • Controlling agents for micro-organism • Food spoilage • Principles and methods of food preservation	12
III	**Beneficial Role of Food Microbes in Health** • Importance of normal flora, prebiotics and probiotics • Fermentation • Single cell proteins • Fermented food products	12
IV	**Food Borne Microbial Diseases** • Public health hazards: Food borne infections and intoxications • Symptoms, mode of transmission and methods of prevention • Emerging food pathogens	12
V	**Food Safety and Quality Control** • Indicator micro-organisms • Concept of Food Safety Management System, GHP and GMP • HACCP, ISO 22000 • Food Laws, Regulations and Standards	12

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading : • Frazier, W.C. & Westoff, D.C. (2013). Food Microbiology. 5th Edition. Tata McGrawHill Publishing Co. Ltd.

• Garbutt, J. (1997). Essentials of Food Microbiology. Arnold London.

• Jay, J.M., Loessner, D.A. & Martin, J. (2006). Modern Food Microbiology. 7th Edition. Springer

• Banwart, G.J. (2004). Basic Food Microbiology. 2 nd Edition. CBS Publishers and Distributors, India.

• Pelczar, M.J., Chan, E.C.S., Krieg, N. (1993). Microbiology. 5th Edition. Tata McGrawHill Publishing Co. Ltd.

• Prescott, L.M., Harley, J.P. & Klein, D.A. (2017). Microbiology. 10th Edition. Tata McGraw-Hill Publishing Co. Ltd.

• Mathur, P. (2018). Food Safety and Quality Control. 1 st Edition. Orient Blackswan Private Ltd. India.

• Forsythe, J.S. (2011). The Microbiology of Safe Food. 2nd Edition. Wiley-Blackwell Publishing.

• Ravishashankar, R. & Jamuna, B. (2015). Microbial Food Safety and Food Preservation. CRC Press, Boca Raton.

• Manual of Methods of Analysis of Foods- Microbiological Testing. (2012). Lab Manual. FSSAI, GoI, New Delhi.

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses:
https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx

PAPER III: INTEGRATED PRACTICAL (HUMAN NUTRITION & FOOD MICROBIOLOGY)

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: IV	Semester: VIII
Subject: Home Science		
Course Code:	**Course Title: INTEGRATED PRACTICAL (HUMAN**	Practical

	NUTRITION & FOOD MICROBIOLOGY)	

Course Objectives: The objective of the integrated practicals of human nutrition and food microbiology is to provide students with hands-on experience and skills that integrate the principles and techniques from both disciplines.

Course outcome:

- Analyze and quantify the nutritional content of food samples, including macronutrients, micronutrients, and dietary fibers.

- Use microbiological techniques to detect, identify, and quantify microorganisms in food samples, assessing microbial safety and quality.

- Apply principles of food safety and hygiene to minimize microbial contamination during food handling, processing, and storage.

- Implement quality assurance measures to maintain nutritional integrity and microbiological safety of food products.

- Evaluate the relationship between nutrition and microbial factors in preventing foodborne illnesses and promoting health.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60 (2 hours per lecture)

Unit	Topic	No. of Lectures
I	Morphology and Structural Features of Various Micro-organisms • Simple staining • Differential staining	12
II	Various Techniques and Instruments Used in Microbiology • Sterilization and Disinfection INTEGRATED Isolation of Microorganisms • Pure Culture Technique • Standard Plate Count Method	12
III	Microbiological Analysis • Water (Most Probable Number) • Milk (Methylene Blue Reduction Test) • Curd and probiotic count • Adulteration test for various food products.	12

IV	Human Balance Studies • Nitrogen balance. • Mineral balance: Ca/Fe/Zn • Estimation of Micronutrient Status • Iodine in salt and urine • Estimation of iron content of a food • • Load test of Vitamin C	12
V	**UNIT V:** Visits to institutions conducting research in human nutrition and report writing of the visit	12

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading :

• Bell, C., Neaves, P. & Williams, A.P. (2005). Food Microbiology and Lab Practice. Wiley Press. 36

• Yousef, A.L. (2003). Food Microbiology. A Laboratory Manual. Wiley Inter-Science New Jersey.

• Benson, H.J. (2002). Microbiological Application.8 th Edition. Tata McGraw Hill.

• Mortimore & Wallace. (2013). HACCP: A Practical Approach. 3 rd Edition. Springer Publication.

• Cappuccino & Sherman. (2007). Microbiology: A laboratory Manual. 7th Edition. Pearson Education Inc.

• Hoorfar, J. (2011). Rapid Detection, Characterization and Enumeration of Food Borne Pathogens. American Society for Microbiology, Washington, USA. • Drinking Water Specification- Indian Standard. (2012).2nd Revision. IS 10500:2012. Bureau of Indian Standard, Manak Bhawan, New Delhi, India.

• Manual of Methods of Analysis of Foods- Microbiological Testing. (2012). Lab Manual 14. FSSAI, GoI, New Delhi.

• Ranganna S. (1986). Handbook of Analysis and Quality Control of Fruit and Vegetable Products. New Delhi: Tata McGraw-Hill Education.

• Raghuramulu N., Madhavan Nair K., Kalyanasundaram S.(2003). A Manual of Laboratory Techniques. Hyderabad: National Institute of Nutrition.

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses:

https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx

PAPER IV ADVANCED NUTRITIONAL BIOCHEMISTRY AND TECHNIQUES

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: IV	Semester: VIII
Subject: Home Science		
Course Code:	**Course Title: ADVANCED NUTRITIONAL BIOCHEMISTRY AND TECHNIQUES**	Theory

Course Objectives: The objective of the "Advanced Nutritional Biochemistry and Techniques" course is to delve deeper into the biochemical principles underlying nutrient metabolism and the advanced techniques used to study nutritional processes.

Course outcome:

- Demonstrate comprehensive knowledge of biochemical pathways and regulatory mechanisms governing nutrient metabolism.
- Evaluate the impact of nutrients on gene expression, epigenetic modifications, and metabolic adaptations.
- Assess the role of nutrients in immune function and inflammatory responses for health and disease prevention.
- Use advanced biochemical and molecular biology techniques (metabolomics, proteomics, transcriptomics) to study nutritional processes.
- Analyze the role of nutrients and supplements in pharmacological interventions and personalized nutrition strategies.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60 (1 hour per lecture)

Unit	Topic	No. of Lectures
I	**Nucleotides, Iron and Heme Metabolism** • Structure of Nucleotides. • De novo synthesis of purines & pyrimidines nucleotides, regulation and salvage pathways • Catabolism of purine and pyrimidine nucleotides • Disorders of purine catabolism (Lesch Nyhan syndrome, Gout, Adenosine deaminase deficiency, Hypouricemia) • Iron metabolism- Mechanisms of transport and cellular uptake • Basic concept of Heme biosynthesis and degradation	15

II	**DNA Organization, Replication and Repair** • Basic structure of DNA • DNA organization basic, replication and repair • Regulation of gene expression (lac operon) • Genetic mutations • Basic principles in Nutrigenomics	15
III	**RNA and Protein Synthesis** • Basic structure of RNA • RNA synthesis and processing (in eukaryotes) • Genetic code • Translation & Post translational modification	15
IV	**Biochemical Techniques** • Chromatographic Techniques - Gel filtration, Ion exchange chromatography, Affinity Chromatography, HPLC Gas Chromatography • Electrophoretic Techniques - Electrophoresis-Polyacrylamide gel electrophoresis (Native and SDS), Agarose gel electrophoresis.	15

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading :

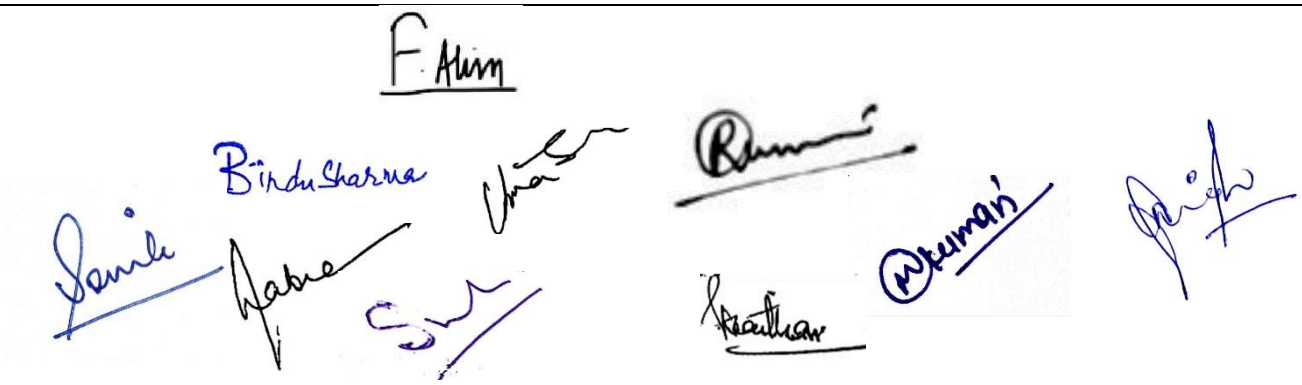
- Berg J M, Stryer. L, Tymoczko JL and Gatto, GJ. (2015) Biochemistry 8th ed. W.H. Freeman.
- Devlin TM. (2010) Text Book of biochemistry with Clinical Correlations 7th ed. John Wiley and Sons.
- Rodwell VW, Bender DA, Botham KM, Kennelly PJ and Weil PA. (2015) Harper's Illustrated Biochemistry. 30th ed. McGraw-Hill. Asia.
- Nelson DL and Cox MM. (2017) Principles of Biochemistry. 7th ed. W.H. Freeman.
- Wilson K and Walker J. (2000) Practical Biochemistry 5th ed. Cambridge University Press.

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses: https://epgp.inflibnet.ac.in/ https://swayam.gov.in/ https://heecontent.upsdc.gov.in/Home.aspx



PAPER V ADVANCED NUTRITIONAL BIOCHEMISTRY AND TECHNIQUES PRACTICAL		
Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: IV	Semester: VIII
Subject: Home Science		
Course Code:	**Course Title: ADVANCED NUTRITIONAL BIOCHEMISTRY AND TECHNIQUES PRACTICAL**	Practical

Course Objectives: Utilize sophisticated laboratory equipment and techniques such as metabolomics, proteomics, and transcriptomics to analyze nutrient metabolism and biochemical pathways and Design and execute complex experiments to investigate nutrient-gene interactions, metabolic pathways, and regulatory mechanisms in nutrition.

Course outcome:

- Analyze and interpret complex data obtained from advanced biochemical and molecular biology experiments, drawing scientifically sound conclusions.
- Evaluate the effects of nutrients and dietary supplements on metabolic pathways and physiological responses using pharmacological approaches.
- Bridge theoretical knowledge with practical applications relevant to clinical nutrition and personalized dietary interventions.
- Develop advanced skills in literature review, experimental design, data interpretation, and scientific communication specific to nutritional biochemistry research.
- Demonstrate ethical conduct in research involving human subjects and sensitive biological materials.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60 (2 hours per lecture)

Unit	Topic	No. of Lectures
I	**Buffers** • Preparation of acidic buffers. • Preparation of basic buffers	12
II	**Spectrophotometry** • DNA estimation • RNA estimation	12
III	**Chromatographic Techniques** • Separation of amino acids.	12
IV	**Electrophoresis** • Agarose gel electrophoresis. • SDS polyacrylamide gel electrophoresis	12

V	**Blood Analysis** • Survey of pathological laboratory to obtain the information on blood and serum analysis tests.	12
Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.		
Suggested Reading : • Plummer D. T., (2015) An Introduction to Practical Biochemistry. 3rd ed., Tata McGraw Hill • Wilson K and Walker J. (2000) Practical Biochemistry 5 th ed. Cambridge University Press.		
This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all		
Suggested Continuous Evaluation Methods: • Seminar/ Presentation on any topic of the above syllabus • Internal assessment/tests • Attendance		
Suggested equivalent online courses: https://epgp.inflibnet.ac.in/ https://swayam.gov.in/ https://heecontent.upsdc.gov.in/Home.aspx		

SEMESTER IX

PAPER I: COMMUNITY AND PUBLIC HEALTH NUTRITION

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year:V	Semester: IX
Subject: Home Science		
Course Code:	**Course Title: COMMUNITY AND PUBLIC HEALTH NUTRITION**	Theory

Course Objectives: The objective of the "Community and Public Health Nutrition" course is to provide students with a comprehensive understanding of the role of nutrition in promoting health at the community and population levels

Course outcome:

- Explain the principles and concepts of public health nutrition, including nutrition assessment, intervention, and evaluation.
- Identify and assess nutritional needs and health issues within diverse populations and communities.
- Design and implement nutrition programs and interventions aimed at improving community health outcomes.
- Evaluate local and global food systems, including food production, distribution, and access, and their impact on community nutrition.
- Discuss nutrition-related public health challenges such as food insecurity, malnutrition, obesity and chronic diseases.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60 (1 hour per lecture)

Unit	Topic	No. of Lectures
I	**Public Health Nutrition and Health Care Systems** • Aim, scope and content of Public Health Nutrition • Role of Public Health Nutritionist in national development	12

	• Health – definition, dimensions, determinants and indicators • Health care of the community • Health care systems, ICDS, Rural Development (National Rural Livelihood Mission, Panchayat Raj Institutions)	
II	**Public Health Aspects of Undernutrition** • Etiology, public health implications, preventive strategies for CED/PEM, Severe Acute Malnutrition, major micronutrient deficiencies (Vitamin A Deficiency, Nutritional Anemias, Iodine Deficiency Disorders, Vitamin D Deficiency and Osteoporosis, Zinc Deficiency) and emerging nutrient deficiencies of public health significance • Maternal/Reproductive health, Adolescent Nutrition and Anemia • National strategies and programmes for prevention of malnutrition	12
III	**Epidemiology:** Basic Concepts, Methods and Applications • Introduction and overview to epidemiology • Epidemiologic study methods- observational and experimental studies • Epidemiology of non-communicable diseases • Demographic, epidemiological and social determinants of NCD's and their mapping: Cardiovascular diseases and Type 2 diabetes, Cancer, Respiratory diseases (COPD and asthma) and other emerging issues and ongoing challenges of non-communicable diseases • Public health strategies for prevention of NCD's: Policies, programmes, taxation and pricing, improving built environment	12
IV	**Approaches/ Strategies for Improving Nutrition and Health Status of the Community** • Health based interventions including immunization, provision of safe drinking water/ sanitation, prevention and management of diarrhoeal diseases and National Policies to address sanitation • Food based interventions including food fortification, dietary diversification, supplementary feeding and biotechnological approaches • Education based interventions including growth monitoring and promotion (GMP), health / nutrition related behaviour change communication	12
V	**Food and Nutrition Security** • Concepts and definitions of food and nutrition security at national, household and individual levels. • Public Sector programmes for improving of food and nutrition security and POSHAN Abhiyaan	12

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading :

- Gibney M J, Margetts B M, Kearney J M Arab (Ist eds) (2004) Public Health Nutrition, NS Blackwell Publishing
- Gopalan C (Ed) (1987) Combating Under nutrition- Basic Issues and Practical Approaches, Nutrition Foundation of India
- Kaufman M (2007) Nutrition in promoting the public health strategies, principles and practices. Jones and Barlett Publishers
- Park K (24th ed) (2017) Park's Textbook of Preventive and Social Medicine, Jabalpur M/s. Banarsidas Bhanot
- ICMR (NIN) Dietary Guidelines for Indians (2nd ed) (2011) Dietary Guidelines for Indians: A manual.
- IFCT (2017) Indian food composition table, NIN
- Ross A C (Eds) (2012) Nutrition in health and disease, Lippincott Williams & Wilkins
- Shils M E (Eds) (1998) Nutrition in health and disease, Lippincott Williams & Wilkins
- NNM: http://www.icds-wcd.nic.in/nnm/home.html
- Vir S (2011) Public health nutrition in developing countries, Woodhead Publishing India limited
- Bonita, R., Beaglehole, R., Kjellström T. (2006) Basic Epidemiology, 2nd Edition, WHO, 2006 http://whqlibdoc.who.int/publications/2006/9241547073_eng.pdf
- Moon, G., Gould, M. (2000). Epidemiology: An Introduction. Philadelphia, Open University Press
- Langseth L. (1996). Nutritional Epidemiology: Possibilities and Limitations. Washington DC, ILSI Press.
- Gordis L. Epidemiology. 5th ed. Philadelphia, PA: Saunders Elsevier, 2013
- Aschengrau A., Seage G.R. (2014) Essentials of Epidemiology in Public Health. 3rd ed. Sudbury, MA: Jones & Bartlett.
- Willett, W. (2013) Monographs in Epidemiology and Biostatistics, Third Edition, Oxford.

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses:

https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx

PAPER II: CLINICAL NUTRITION

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: V	Semester: IX
Subject: Home Science		
Course Code:	**Course Title: CLINICAL NUTRITION**	Theory

Course Objectives: The objective of the "Clinical Nutrition" course is to equip students with the knowledge and skills necessary to assess, diagnose, and manage nutritional issues and diseases in clinical settings.

Course outcome:

- Describe the physiological and biochemical basis of nutrient requirements across the lifespan and in various clinical conditions.
- Use appropriate methods and tools to assess the nutritional status of patients, including anthropometric measurements, dietary assessments, biochemical markers, and clinical indicators.
- Identify and diagnose nutritional deficiencies, malnutrition, and other nutrition-related disorders based on assessment findings and medical history.
- Formulate individualized nutrition care plans and interventions that address the specific nutritional needs and health goals of patients.
- Implement evidence-based medical nutrition therapy to manage and treat conditions such as diabetes, cardiovascular diseases, renal disorders, gastrointestinal disorders, and critical illness.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60

Unit	Topic	No. of Lectures
I	**Nutritional Assessment and Care of Patients** • Nutrition care process - Nutritional screening and assessment of patients – out patient & hospitalized • Tools for screening - Nutritional interpretation of routine medical and laboratory data • Nutrition care plan and implementation • Monitoring and follow up • Ethical issues • Dietary Counseling	12

	• Nutrition Support: Enteral Nutrition	
II	**Medical Nutrition Therapy in metabolic diseases** • Diabetes Mellitus – Type 1, Type 2 and Gestational diabetes • Endocrine disorders – Polycystic ovary disease, thyroid	12
III	**Coronary Heart Diseases** • Etio-pathophysiology, metabolic & clinical aberrations, diagnosis, complications, treatment, MNT, dietary counselling and recent advances in Hypertension, dyslipidemia, Congestive heart failure Unit IV Gastrointestinal tract Disorders • Etio-pathophysiology, metabolic & clinical aberrations, diagnosis, complications, treatment, MNT, dietary counselling and recent advances in o GERD, peptic ulcer, dyspepsia, flatulence, inflammatory bowel disease, diverticular disease, hernia, hemorrhoids, intestinal surgery, bariatric surgery. Nutrition for oral and dental disorders	12
IV	**Pediatric Nutrition** • Inborn errors of metabolism – Phenylketonuria, Galactosemia, Maple Syrup Urine Disease, Glycogen Storage Disease • Severe Acute Malnutrition • Cystic fibrosis	12
V	**Overview of some degenerative disorders** • Cancer – General and specific cancers, effect of cancer therapy on MNT, • Role of diet in etiology and management • Chronic Obstructive Pulmonary Disease • Systemic Lupus Erythematosis • Nutrition for bone health	12
Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.		

Suggested Reading:

• Gibney MJ, Elia M, Ljungqvist &Dowsett J. (2005) Clinical Nutrition. The Nutrition Society Textbook Series. Blackwell Publishing Company

• Gibson SR. (2005). Principles of Nutritional Assessment. 2nd Edition. Oxford University press

• Joshi YK. Basics of Clinical Nutrition. 2nd Edition. Jaypee Brothers Medical Publishers.

• Lee RD & Neiman DC. (2009). Nutritional Assessment. 5th Edition. Brown & Benchmark.

• Mahan, L. K. and Escott Stump. S. (2016) Krause's Food & Nutrition Therapy 14th ed. Saunders-Elsevier

• 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.

• Williams, S.R. (2001) Basic Nutrition and Diet Therapy. 11th ed. Times Mirror Mosby College Publishing

• 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

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses:
https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx

PAPER III: CLINICAL NUTRITION

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: V	Semester: IX
Subject: Home Science		
Course Code:	**Course Title: CLINICAL NUTRITION**	Practical

Course Objectives: The objectives of the practical component in Clinical Nutrition aim to provide students with hands-on experience and skills necessary to apply theoretical knowledge in clinical settings

Course outcome:

• Use anthropometric measurements, dietary assessment tools, biochemical markers, and clinical assessments to evaluate the nutritional status of patients.

• Formulate individualized nutrition care plans based on patient assessments, medical history, and nutritional needs.

• Apply evidence-based nutrition interventions to manage and treat various medical conditions such as diabetes, cardiovascular diseases, renal disorders, gastrointestinal disorders, and critical illness.

• Monitor patients' progress, evaluate outcomes, and adjust nutrition interventions as necessary to optimize patient health and nutritional status.

- Educate patients and caregivers about therapeutic diets, nutrition-related disease management, and lifestyle modifications to support health goals.

- Work collaboratively with healthcare professionals, including physicians, nurses, and dietitians, to integrate nutrition therapy into comprehensive patient care plans.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60(2 hours per lecture)

Unit	Topic	No. of Lectures
I	**Assessment of patient needs –** nutritional assessment and screening • Recording of BP using a Sphygmomanometer • Use of Pulse Oximeter • Use of Glucometer • Interpretation of OGTT, HbA1c values • Interpretation of RFT and LFT	12
II	**Planning and preparation of diets for following diseases** • Type 1 diabetes • Type 2 diabetes • Gestational Diabetes • Peptic ulcer • Hypertension and dyslipidemia • Congestive heart failure • Ulcerative colitis • Diverticular disease • Cancer • IEM and SAM • Antenatal clinic, high risk pregnancy	12
III	Visit to a hospital and patient assessment.	12
IV	**Market Survey of the Following Products** • Food supplements • Enteral formulas • Functional foods • Disease specific foods	12
V	Survey Report	12

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading :

• Gibney MJ, Elia M, Ljungqvist &Dowsett J. (2005) Clinical Nutrition. The Nutrition Society Textbook Series. Blackwell Publishing Company • Gibson SR. (2005). Principles of Nutritional Assessment. 2nd Edition. Oxford University press

• Joshi YK. Basics of Clinical Nutrition. 2nd Edition. Jaypee Brothers Medical Publishers.

• Lee RD & Neiman DC. (2009). Nutritional Assessment. 5th edition. Brown & Benchmark.

• Mahan, L. K. and Escott Stump. S. (2016) Krause's Food & Nutrition Therapy 14th ed. Saunders-Elsevier

• 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.

• Williams, S.R. (2001) Basic Nutrition and Diet Therapy. 11th ed. Times Mirror Mosby College Publishing 52 • 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.

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses:
https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx

PAPER IV : INSTITUTIONAL FOOD SERVICE MANAGEMENT

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: V	Semester: IX
Subject: Home Science		
Course Code:	**Course Title: INSTITUTIONAL FOOD SERVICE MANAGEMENT**	Theory

Course Objectives: The objective of the "Institutional Food Service Management" course is to provide students with the knowledge and skills necessary to effectively manage food service operations in institutional settings.

Course outcome:

- Explain the principles and components of food service management, including menu planning, food production, procurement, and distribution.

- Implement food safety standards, sanitation practices, and hygiene protocols to ensure safe food handling and prevent foodborne illnesses.

- Incorporate nutrition principles and dietary guidelines into menu planning and food preparation to promote health and wellness among clientele.

- Plan and manage efficient food production processes, including portion control, inventory management, and kitchen workflow.

- Develop budgets, cost controls, and financial strategies to optimize resources and maintain profitability in food service operations.

- Manage staffing needs, recruit and train personnel, and promote teamwork and professional development among food service staff.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60 (1 hour per lecture)

Unit	Topic	No. of Lectures
I	**Managing catering processes** • Approaches to management • Classical, Scientific, Systems approach, Management by Objective, Just-in Time, Total Quality Management, Quality of Work Life • **Tools of Management** – Tangible Tools: Organization chart, Job description, Job specification, Job analysis: Path way chart, Process chart, Work schedule, Production schedule, Staff and service analysis, Budget Intangible tools: Communication, Leadership, Decision making .	20
II	**Food production cycle in various food service institutions** • Meal Ordering System (manual, electronic) • Menu construction (hospital, canteen, MDM, food stall) • Menu card/ display • Food production processes for various situations • Guidelines of regulatory bodies	20
III	**Managing Resources** • Manpower • Functions of a personnel manager, absenteeism, labour turnover	20

	• Recruitment and selection process - Process and Sources-Internal and External, Process interview, **Tests** • Orientation and Training- Importance of orientation and training, content of programme, Steps of developing an Orientation programme, Types of training - OJT, Group; continuous training, training for development, Developing a training programme • Appraisal of employees – Importance, Methods, Limitation • Motivating employees- Motivation theories and approaches - Content theories: Maslow, Herzberg, McClelland; Process theories: Vroom, Equity; Reinforcement theory; Techniques of motivating employees • Employee behavior and policies • Finance and Marketing • Managing finances in a catering establishment • Records: Menu, Purchase, Store, Production, Sales, Personnel, Utilities • Reports: Cost analysis: Concept of Trial Balance, Profit and Loss Account • Marketing techniques and strategies • Equipment and Layouts • Types of equipment - Steps in layout planning and architectural features • Feasibility assessment in terms of layout planning	

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading :

• West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised By Hargar FV, Shuggart SG, & Palgne Palacio June, Macmillian Publishing Company New York.

• Sethi Mohini (2005) Institution Food Management. New Age International Publishers

• Kazarian E A (1977) Food Service facilities Planning 3rd Edition Von Nostrand Reinhold New York.

• Kotas Richard & Jayawardardene. C (1994) Profitable Food and Beverage Management Hodder & Stoughton Publications

• Kotler Philip. (2001) Marketing management Millennium Edition Prentice Hall of India.

• Taneja S and Gupta SL (2001) Entrepreneurship development, Galgotia Publishing.

• Dessler Gary (2007) Human Resource Management 11th edition Prentice Hall New Jersey.

• Luthans Fred (2004) Organisational Behaviour 10th Edition Mc Graw Hill International.

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests

• Attendance
Suggested equivalent online courses: https://epgp.inflibnet.ac.in/ https://swayam.gov.in/ https://heecontent.upsdc.gov.in/Home.aspx

PAPER V: INSTITUTIONAL FOOD SERVICE MANAGEMENT

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: V	Semester: IX
Subject: Home Science		
Course Code:	**Course Title: INSTITUTIONAL FOOD SERVICE MANAGEMENT**	Practical

Course Objectives:

To provide students with practical skills and experience necessary to manage food service operations effectively in institutional settings, ensuring quality, safety, efficiency, and customer satisfaction.

Course outcome:

- Develop menus that align with nutrition guidelines, dietary requirements, and customer preferences for institutional settings.
- Manage kitchen operations effectively, including food preparation, portion control, and quality assurance.
- Implement and monitor food safety protocols, sanitation practices, and hygiene standards to ensure compliance and prevent foodborne illnesses.
- Develop and manage budgets, cost control measures, and financial strategies to optimize resources and maintain profitability.
- Recruit, train, and supervise staff members to ensure they adhere to food safety standards, maintain quality service, and foster a positive work environment.
- Implement strategies to enhance customer satisfaction through personalized service, efficient operations, and responsiveness to feedback.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36
Total No. of Lectures – 60 (2 hours per lecture)	

Unit	Topic	No. of Lectures
I	• Market survey of various food products-raw and processed in different kind of markets.	12
II	• Planning menus for the following: ➢ Conference ➢ Food stall	12
III	• Planning menu and adjusting nutrients and cost for the following: ➢ Food items for MDM ➢ cyclic menu for hospital (government/private) • Standardizing recipes in quantity cooking	12
IV	• Canteen project/ Event catering • Developing/training	12
V	• Development of sale promotion tool • Training Food service unit personnel in hygiene and sanitation.	12

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading :

• West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised By Hargar FV, Shuggart SG, & Palgne Palacio June, Macmillian Publishing Company New York.

• Sethi Mohini (2005) Institution Food Management. New Age International Publishers • Kazarian E A (1977) Food Service facilities Planning. 3rd Edition Von Nostrand Reinhold New York.

• Kotas Richard & Jayawardardene. C (1994) Profitable Food and Beverage Management. Hodder & Stoughton Publications

• Taneja S and Gupta SL (2001) Entrepreneurship Development, Galgotia Publishing.

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses:
https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx

SEMESTER X

GROUP A

PAPER I: Advanced Clinical Nutrition

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: V	Semester:X
Subject: Home Science		
Course Code:	**Course Title: Advanced Clinical Nutrition**	Theory

Course Objectives:

To prepare students for advanced roles in clinical nutrition, equipping them with the knowledge and skills needed to improve patient outcomes through effective nutritional management.

Course outcome:

- Gain in-depth knowledge of the biochemical and physiological functions of nutrients and their impact on human health.
- Apply advanced nutritional principles to assess and manage the nutritional needs of individuals and populations, considering various health conditions and diseases.
- Develop the ability to critically evaluate and conduct research in clinical nutrition, including the interpretation of scientific literature and data analysis.
- Master techniques for assessing nutritional status using advanced tools and methodologies, including laboratory tests, dietary analysis, and anthropometric measurements.
- Design and implement evidence-based nutritional interventions for disease prevention and management, tailored to individual patient needs.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60 (1 hour per lecture)

Unit	Topic	No. of Lectures
I	**Nutrition Care** • Nutrition Support – Parenteral Nutrition: International and National Guidelines.	10
II	**Hepatobiliary and Pancreatic Disorders** • Etio-pathophysiology, metabolic & clinical aberrations, diagnosis, complications and recent advances in prevention, treatment, MNT and dietary counselling in Nonalcoholic fatty liver disease (NAFLD), Cirrhosis, End stage liver disease (ESLD), Encephalopathy, Liver resection and transplant; Cholecystitis, Cholelithiasis, cholecystectomy, Pancreatitis.	10

III	**Diseases of Heart and Blood Vessels** • Etio-pathophysiology, metabolic & clinical aberrations, diagnosis, complications and recent advances in prevention, treatment, MNT and dietary counselling in Myocardial Infarction, Coronary artery bypass graft (CABG), angioplasty, cerebrovascular and peripheral vascular disease, heart transplant.	10
IV	**Surgery and Critical Care** • Metabolic & clinical aberrations, diagnosis, complications, treatment, MNT and dietary Counselling in Metabolic Stress - Surgery, Burns, Sepsis and Trauma, Critical care.	10
V	**Renal Disorders** • Etio-pathophysiology, metabolic & clinical aberrations, diagnosis, complications and recent advances in prevention, treatment, MNT and dietary Counselling in Nephrotic Syndrome, Glomerulonephritis, Acute Renal Failure, Chronic Kidney Disease, End Stage Renal Disease (ESRD), Dialysis, Transplant, Renal Stones.	10
VI	**Neurological disorders** • Etiopathophysiology, metabolic & clinical aberrations, diagnosis, complications and recent advances in prevention, treatment, MNT and dietary Counselling in Alzheimer's disease, Parkinson disease, Epilepsy.	10

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading :

• Mahan, L. K. and Escott Stump. S. (2016) Krause's Food & Nutrition Therapy 14th ed. Saunders-Elsevier

• Joshi Y K.(2008) Basics of Clinical Nutrition 2nd ed. Jaypee Brothers Medical Publishers

• Shils, M.E., Shike, M, Ross, A.C., Caballero B and Cousins RJ (2005) Modern Nutrition in Health and Disease. 10thed. Lipincott, William and Wilkins.

• Gibney MJ, Elia M, Ljungqvist &Dowsett J. (2005) Clinical Nutrition. The Nutrition Society Textbook Series. Blackwell Publishing Company

• Garrow, J.S., James, W.P.T. and Ralph, A. (2000) Human Nutrition and Dietetics. 10th ed. Churchill Livingstone.

• Marian M, Russel M, Shikora SA. (2008) Clinical Nutrition for Surgical Patients. Jones and Bartlett Publishers.

<table>
<tr><td>• McClave, S.A., Taylor, B.E., Martindale, R.G., Warren, M.M., Johnson, D.R., Braunschweig, C., McCarthy, M.S., Davanos, E., Rice, T.W., Cresci, G.A. and Gervasio, J.M. (2016). Guidelines for the provision and assessment of nutrition support therapy in the adult critically ill patient: Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (ASPEN). Journal of Parenteral and Enteral Nutrition, 40(2), pp.159-211</td></tr>
<tr><td>This course can be opted as an elective/ value-added course by the students of the following subjects:
Open for all</td></tr>
<tr><td>Suggested Continuous Evaluation Methods:
• Seminar/ Presentation on any topic of the above syllabus
• Internal assessment/tests
• Attendance</td></tr>
<tr><td>Suggested equivalent online courses:
https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx</td></tr>
</table>

PAPER II: ADVANCED CLINICAL NUTRITION PRACTICAL

<table>
<tr><td>Programme /Class : M.Sc FOOD & NUTRITION (NEP)</td><td>Year: V</td><td>Semester:X</td></tr>
<tr><td colspan="3">Subject: Home Science</td></tr>
<tr><td>Course Code:</td><td>Course Title: ADVANCED CLINICAL NUTRITION PRACTICAL</td><td>Practical</td></tr>
<tr><td colspan="3">Course Objectives: It aims to provide hands-on experience and skill development, ensuring that students are well-prepared for professional practice in clinical nutrition.

Course outcome:

• Develop proficiency in using various tools and methods for assessing the nutritional status of individuals, including dietary recalls, food frequency questionnaires, anthropometric measurements, and biochemical tests.

• Analyze and manage real-world clinical cases to apply theoretical knowledge in practical settings, focusing on the nutritional care process for various medical conditions.

• Gain hands-on experience in creating personalized diet plans and providing nutritional counseling tailored to individual needs, preferences, and medical conditions.

• Acquire practical skills in performing and interpreting laboratory tests related to nutrition, such as blood glucose levels, lipid profiles, and micronutrient assays.

• Design and implement evidence-based nutritional interventions, monitor progress, and adjust plans as necessary to meet clinical goals.</td></tr>
<tr><td colspan="2">Credits:4</td><td>Core Compulsory</td></tr>
</table>

Max. Marks: 30+70=100		Min. Passing Marks : 36
Total No. of Lectures – 60 (2 hours per lecture)		
Unit	**Topic**	**No. of Lectures**
I	Market Survey for commercial nutritional therapeutic products	12
II	**Planning & preparation of diets for the following conditions** • Post burn • Liver Cirrhosis • Hepatic Encephalopathy	12
III	• Pancreatitis	4
IV	• Myocardial infarction • Congestive heart failure	12
V	• Nephritis • Acute Renal Failure • Chronic renal failure • Patients on dialysis	20

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading :

• Dorland WA Newman. (2003) Dorland's Illustrated Medical Dictionary. 30th ed. WB Saunders Co.

• Escott-Stump, S. (2002) Nutrition and Diagnosis Related Care. 5th ed. Williams and Wilkins. 82

• Garrow, J.S., James, W.P.T. and Ralph, A. (2000) Human Nutrition and Dietetics. 10th ed. Churchill Livingstone.

• Mahan, L. K. and Escott Stump. S. (2016) Krause's Food & Nutrition Therapy 14th ed. Saunders-Elsevier

• Shils, M.E., Shike, M, Ross, A.C., Caballero B and Cousins RJ (2005) Modern Nutrition in Health and Disease. 10thed. Lipincott, William and Wilkins.

• Williams, S.R. (2001) Basic Nutrition and Diet Therapy. 11th ed. Times Mirror Mosby College Publishing

• Davis, J. and Sherer, K. (1994) Applied Nutrition and Diet Therapy for Nurses. (2nded). W. B. Saunders Co.

• Fauci, S.A et al (1998) Harrison's Principles of Internal Medicine, 14th ed. McGraw Hill.

• Guyton, A.C and Hall, J.E. (2000) Textbook of Medical Physiology. 10th ed. India: Harcourt Asia.

• Ritchie, A.C (1990) Boyd's Textbook of Pathology. 9thed. Lea and Febiger, Philadelphia

• 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.

• Gibson SR. (2005). Principles of Nutritional Assessment. 2nd Edition. Oxford University press

• Gibney MJ, Margetts BM, Kearny JM & ArabI. (2004) - Public Health Nutrition. NS Blackwell publishing

• Gibney MJ, Elia M, Ljungqvist &Dowsett J. (2005) Clinical Nutrition. The Nutrition Society Textbook Series. Blackwell publishing Company

• Marian M, Russel MK, Shikora SA. (2008) Clinical Nutrition for Surgical Patients. Jones & Bartlett Publisher

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses:
https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx

PAPER III: NUTRITION COMMUNICATION AND DIET COUNSELLING

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: V	Semester:X
Subject: Home Science		
Course Code:	**Course Title**: **NUTRITION COMMUNICATION AND DIET COUNSELLING**	Theory

Course Objectives: To Equip students with the communication and counseling skills necessary to effectively support and guide individuals in achieving their nutritional goals and improving their overall health and well-being.

Course outcome:

- Develop advanced skills in verbal and non-verbal communication to effectively convey nutritional information and advice to diverse audiences, including individuals, groups, and communities.

- Learn and apply various counseling theories and techniques to support and motivate individuals in making positive dietary and lifestyle changes.

- Understand and utilize evidence-based behavior change models and strategies to encourage long-term adherence to healthy eating patterns.

- Gain an understanding of cultural, social, and economic factors that influence dietary habits and learn to provide culturally sensitive and inclusive nutritional advice.

- Enhance interpersonal skills to build trust and rapport with clients, creating a supportive and empathetic counseling environment.

- Develop skills in creating effective educational materials and resources tailored to different audiences, including brochures, handouts, presentations, and digital content.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60 (1 hour per lecture)

Unit	Topic	No. of Lectures
I	**Communication** • Communication methods • Traditional, Current and Emerging methods/tools of communication • Characteristics of effective communication, Skills and attributes of a communicator • Approaches in communication • Barriers to effective communication	12
II	**Nutrition Counselling** • Concept and importance of Counselling in the nutrition care process • Understanding dietary patterns and food choices and their impact on Counselling • Behaviour Change Communication and Models for behaviour change • Counselling strategies • Factors to be considered for Counselling • Conventional and non-conventional tools in Counselling	12
III	**Processes involved in Dietary Counselling** • Managing resources of the communicator/counsellor • Designing of Counselling plans – goals & objectives, evaluation instruments. • Implementation: facilitating self-management of disease condition • Evaluation: evaluating adherence to dietary changes • Counselling approaches after evaluation	12

IV	**Dietary Counselling through the Life Span –** Considerations for Counselling plans for: • Antenatal and pregnant women • Lactating women • Childhood nutrition problems • SAM, weight management, vitamin and mineral deficiencies • School children, adolescents, young adults • Fitness, weight management, eating disorders **Managing diet related chronic diseases in adults:** • Obesity • Diabetes • Dyslipidemia • Hypertension • Cancer risk prevention • Renal disease • Liver disorders • Geriatric counselling	12
V	**Nutritional/medicinal role of traditional foods** • Traditional food beliefs • Role of Ayurveda, Naturopathy, Yoga and other traditional medicines in disease management.	12

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading :

• Mahan, L. K. and Escott Stump. S. (2016) Krause's Food & Nutrition Therapy 14th ed. Saunders-Elsevier

• Snetselaar L. (2009). Nutrition Counselling Skills for the Nutrition Care Process. Fourth Ed. Sudbury, Massachusetts: Jones Bartlett Publishers.

• Holli B Betsy and Beto A Judith. (2014). Nutrition Counselling and Education Skills for Dietetics Professionals. Sixth edition. USA: Lippincot Williams and Wilkins; Wolters Kluwer.

• Gable J. (2016). Counselling Skills for dietitians. Florida, USA: JohnWiley and Sons.

• Midwinter R and Dickson J.(2015). Embedding Counselling and Communication Skills. A Relational Skills Model. Routledge 2015

• Devito Joseph A. (2015) Human Communication: The Basic Course. New York:Pearson

• King K and Klawitter B.(2007). Nutrition Therapy. Advanced Counselling Skills. Third Edition. Philadelphia, USA: Lippincot Williams and Wilkins; Wolters Kluwer. 2007

• http://www.fao.org/docrep/X2550E/X2550e04.htm

• Ravi M (2016) Counselling what why and how, New Delhi, Viva Books

• McClave, S.A., Taylor, B.E., Martindale, R.G., Warren, M.M., Johnson, D.R., Braunschweig, C., McCarthy, M.S., Davanos, E., Rice, T.W., Cresci, G.A. and Gervasio, J.M. (2016). Guidelines for the provision and assessment of nutrition support therapy in the adult critically ill patient: Society of Critical Care Medicine

(SCCM) and American Society for Parenteral and Enteral Nutrition (ASPEN). Journal of Parenteral and Enteral Nutrition, 40(2), pp.159-211.

- WHO 2016, Antenatal guidelines

This course can be opted as an elective/ value-added course by the students of the following subjects:
Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses:
https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx

PAPER IV NUTRITION FOR FITNESS AND SPORTS

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: V	Semester:X
Subject: Home Science		
Course Code:	**Course Title** : **NUTRITION FOR FITNESS AND SPORTS**	Theory

Course Objectives:

To equip students with the knowledge and skills necessary to support athletes and fitness enthusiasts in achieving their performance goals through optimal nutrition.

Course outcome:

- Understand the basic principles of sports nutrition, including the role of macronutrients and micronutrients in athletic performance, recovery, and overall health.
- Learn to calculate and assess the energy needs of athletes and active individuals based on their specific sports, training intensity, and body composition goals.
- Gain knowledge about the importance of nutrient timing and meal planning to optimize performance, endurance, and recovery in various sports and physical activities.
- Understand the critical role of hydration in athletic performance and learn to develop individualized hydration plans to prevent dehydration and maintain electrolyte balance.
- Evaluate the efficacy, safety, and legality of dietary supplements commonly used in sports and fitness, and provide evidence-based recommendations for their use.
- Explore and assess various specialized diets (e.g., ketogenic, plant-based, high-protein) and their potential benefits and drawbacks for athletes and fitness enthusiasts.

Credits:4		Core Compulsory
Max. Marks: 30+70=100		Min. Passing Marks : 36
Total No. of Lectures – 60 (1 hour per lecture)		
Unit	**Topic**	**No. of Lectures**
I	**Introduction to Physical Fitness** • Definition of physical fitness • Components of physical fitness • Methods of assessing physical fitness • Approaches to achieving physical fitness through the life cycle	15
II	**Fundamentals of Sports Nutrition** • Integrated approach to care for athletes • Assessment of Sports performance • Bioenergetics and body metabolism of physical activity and sports • Macro- and micro nutrients for sport performance	15
III	**Nutrition for High Performance Athletes** • Recommended allowances and nutritional guidelines for different categories of high performance sports • Nutritional care during Training, weight management and day-today recovery • Nutrition for the Pre-competition, Competition and post competition recovery phase • Supplements in Sport performance enhancing substances, drugs, ergogenic aids and herbs in sports performance	15
IV	**Challenges in Sports Nutrition`** • Nutritional care for children and adolescent athletes • Athletes with special needs- Paralympics & special Olympics, vegetarian athletes, • Athletes with eating disorders, athletes with diabetes and other medical conditions	15

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading :

• ILSI, NIN &SAI. (2017) Nutritional recommendations for high performance athletes2nded.

• Mahan, L. K. and Escott Stump S. (2016) Krause's Food & Nutrition Therapy. 14th ed. Saunders-Elsevier.

• Hickson JF and Wolinksky I. (1997) Nutrition for exercise and Sport. 2nd ed.CRC Press, 88

• Burke LM and Deakin V. (2002) Clinical Sports Nutrition, 2nd edition, Publishers McGraw Hill

• Dan Benardot. (2011) Advanced Sports Nutrition-2nd Edition.

• Fink H H and Mikesky A E. (2017) Practical Applications in Sports Nutrition 5th Edition.

• Bushman B. (2017) ACSM's Complete Guide to Fitness & Health 2nd Edition Published by ACSM.

• Vasuja, M (2017). Health Education and Sports Nutrition. New Delhi, Friend's Publication (India)

This course can be opted as an elective/ value-added course by the students of the following subjects:
Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses:
https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx

PAPER V: NUTRITION COMMUNICATION AND DIET COUNSELLING

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: V	Semester:X
Subject: Home Science		
Course Code:	**Course Title: NUTRITION COMMUNICATION AND DIET COUNSELLING**	Practical

Course Objectives:

It aims to provide hands-on—experience and skill development, ensuring that students are well- prepared for professional practice in the field of sports and fitness nutrition.

Course outcome:

- Develop proficiency in assessing the nutritional status of athletes and active individuals using dietary recalls, food frequency questionnaires, body composition analysis, and biochemical tests.

- Practice calculating the energy and nutrient requirements specific to different sports, training regimens, and individual goals such as muscle gain, fat loss, or maintenance.

- Create and implement personalized meal plans that optimize nutrient timing for pre-workout, intra-workout, and post-workout nutrition to enhance performance and recovery.

- Develop individualized hydration protocols based on sweat rates, electrolyte needs, and environmental conditions to maintain optimal hydration status during training and competition.

- Evaluate the use of dietary supplements, understanding their benefits, risks, and legal considerations, and make evidence-based recommendations for athletes.

Credits:4		Core Compulsory
Max. Marks: 30+70=100		Min. Passing Marks : 36
Total No. of Lectures – 60 (2 hours per lecture)		
Unit	**Topic**	**No. of Lectures**
I	**Understanding the use of conventional and non-conventional methods of counselling** • Face to face counselling • Use of a software for counselling e.g Dietcal • Use of any one Diet App for counselling and assessing food intake	12
II	**Planning Nutrition Counselling sessions and identifying ways to adhere to dietary changes for the following conditions** • IYCF, Lactation Counselling, SAM, Antenatal counselling • Eating Disorders • Overweight/Obesity in School children, adolescent and adults • Metabolic Syndrome • Diabetes: Type 1, Type 2 and Gestational Diabetes • Renal Disease: CKD/ESRD/Post kidney Transplant • Liver Disorders: NAFLD	12
III	• PAR-Q assessment and interpretation for fitness	12
IV	• Planning a day's diet for a fitness trainee who works out twice in a gymnasium • Planning a training day's diet for an individual high-performance athlete (any one sport- (cover all categories of sports in groups) • Planning a weight loss diet for a high performance athelete	12
V	• Survey of sports supplements	12
Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.		

Suggested Reading :

• Mahan, L. K. and Escott Stump. S. (2016) Krause's Food & Nutrition Therapy 14th ed. Saunders-Elsevier

• Snetselaar L. (2009). Nutrition Counselling Skills for the Nutrition Care Process. Fourth Ed. Sudbury, Massachusetts: Jones Bartlett Publishers.

• Holli B Betsy and Beto A Judith. (2014). Nutrition Counselling and Education Skills for Dietetics Professionals. Sixth edition. USA: Lippincot Williams and Wilkins; Wolters Kluwer.

• Gable J. (2016). Counselling Skills for dieticians. Florida, USA: JohnWiley and Sons.

• Midwinter R and Dickson J. (2015). Embedding Counselling and Communication Skills. A Relational Skills Model. Routledge 2015

• Devito Joseph A. (2015) Human Communication: The Basic Course. New York: Pearson • King K and Klawitter B (2007). Nutrition Therapy. Advanced Counselling Skills. Third Edition. Philadelphia, USA: Lippincot Williams and Wilkins; Wolters Kluwer. 2007 • http://www.fao.org/docrep/X2550E/X2550e04.htm • McClave, S.A., Taylor, B.E., Martindale, R.G., Warren, M.M., Johnson, D.R., Braunschweig, C., McCarthy, M.S., Davanos, E., Rice, T.W., Cresci, G.A. and Gervasio, J.M. (2016). Guidelines for the provision and assessment of nutrition support therapy in the adult critically ill patient: Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (ASPEN). Journal of Parenteral and Enteral Nutrition, 40(2), pp.159-211. • WHO 2016, Antenatal guidelines
This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all
Suggested Continuous Evaluation Methods: • Seminar/ Presentation on any topic of the above syllabus • Internal assessment/tests • Attendance
Suggested equivalent online courses: https://epgp.inflibnet.ac.in/ https://swayam.gov.in/ https://heecontent.upsdc.gov.in/Home.aspx

GROUP B

PAPER I : PROBLEMS, POLICIES AND PROGRAMMES IN PUBLIC HEALTH NUTRITION

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: V	Semester: X
Subject: Home Science		
Course Code:	**Course Title: PROBLEMS, POLICIES AND PROGRAMMES IN PUBLIC HEALTH NUTRITION**	Theory

Course Objectives:

It aims to prepare students to effectively address nutritional problems at the population level through the development, implementation, and evaluation of evidence-based policies and programs.

Course outcome:

- Gain a comprehensive understanding of the principles and concepts of public health nutrition, including the determinants of health and nutritional status at the population level.
- Learn to identify and analyze major nutritional problems affecting different populations, such as malnutrition, obesity, micronutrient deficiencies, and diet-related chronic diseases.
- Develop skills in nutritional epidemiology to study the distribution and determinants of nutritional problems within populations.
- Understand the process of developing, implementing, and evaluating public health nutrition policies, and analyze existing policies at local, national, and international levels.
- Gain knowledge and skills in planning, implementing, and managing public health nutrition programs aimed at improving nutritional status and health outcomes.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36
Total No. of Lectures – 60	

Unit	Topic	No. of Lectures
I	**Public Health Aspects of Undernutrition** • Etiology, public health implications, preventive strategies and community based management of Protein Energy Malnutrition, Chronic Energy Deficiency, Severe Acute Malnutrition and major micronutrient deficiencies (Vitamin A Deficiency, Nutritional Anemias, Iodine Deficiency Disorders, Vitamin D Deficiency and Osteoporosis, Zinc Deficiency) and emerging nutrient deficiencies of public health significance • Maternal Nutrition, Adolescent Nutrition and Anemia	12
II	**Public Health Aspects of Life Style Related Disorders**	12

	• Public health implications and preventive strategies for obesity, hypertension, coronary heart disease, diabetes, osteoporosis, cancer and dental caries	
III	**National / Public Sector Policies for Promotion of Nutrition and Health Status of the Population** • National Nutrition Policy, Poshan Abhiyan, National Health Policy, National Food Security Act, National Water Policy, National Urban Sanitation Policy	12
IV	**National / Public Sector Programmes for Promotion of Nutrition and Health Status of the Population** • Nutrition sensitive and nutrition specific programmes • Critical appraisal of ongoing public sector programmes and some success stories	12
V	National Health Programmes in India	12

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading :

• Gibney M J, Margetts B M, Kearney J M Arab (Ist eds) (2004) Public Health Nutrition, NS Blackwell Publishing

• Gopalan C (Ed) (1987) Combating Under nutrition- Basic Issues and Practical Approaches, Nutrition Foundation of India

• Kaufman M (2007) Nutrition in promoting the public health strategies, principles and practices. Jones and Barlett Publishers

• Park K (24th ed) (2017) Park's Textbook of Preventive and Social Medicine, Jabalpur M/s. Banarsidas Bhanot

• ICMR (NIN) Dietary Guidelines for Indians (2nd ed) (2011) Dietary Guidelines for Indians: A manual.

• IFCT (2017) Indian food composition table, NIN

• Ross A C (Eds) (2012) Nutrition in health and disease, Lippincott Williams & Wilkins

• Shils M E (Eds) (1998) Nutrition in health and disease, Lippincott Williams & Wilkins

• NNM: http://www.icds-wcd.nic.in/nnm/home.html

• Vir S (2011) Public health nutrition in developing countries, Woodhead Publishing India limited

- Bonita, R., Beaglehole, R., Kjellström T. (2006) Basic Epidemiology, 2nd Edition, WHO, 2006 http://whqlibdoc.who.int/publications/2006/9241547073_eng.pdf
- Moon, G., Gould, M. (2000). Epidemiology: An Introduction. Philadelphia, Open University Press
- Langseth L. (1996). Nutritional Epidemiology: Possibilities and Limitations. Washington DC, ILSI Press.
- Gordis L. Epidemiology. 5th ed. Philadelphia, PA: Saunders Elsevier, 2013
- Aschengrau A., Seage G.R. (2014) Essentials of Epidemiology in Public Health. 3rd ed. Sudbury, MA: Jones & Bartlett.
- Willett, W. (2013) Monographs in Epidemiology and Biostatistics, Third Edition, Oxford.

This course can be opted as an elective/ value-added course by the students of the following subjects:
Open for all

Suggested Continuous Evaluation Methods:

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Suggested equivalent online courses:
https://epgp.inflibnet.ac.in/
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PAPER II: NUTRITIONAL EPIDEMIOLOGY

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: V	Semester: X
Subject: Home Science		
Course Code:	**Course Title: NUTRITIONAL EPIDEMIOLOGY**	Theory

Course Objectives:

It aims to equip students with the knowledge and skills necessary to conduct and interpret nutritional epidemiology research, contributing to the understanding of diet-disease relationships and informing public health nutrition policy and practice.

Course outcome:

- Understand the basic principles and methods of epidemiology, including study design, data collection, and statistical analysis.
- Gain proficiency in various methods for assessing dietary intake and nutritional status, including food frequency questionnaires, 24-hour recalls, dietary records, and biomarkers.
- Learn about different epidemiological study designs used in nutritional research, such as cross-sectional, cohort, case-control, and randomized controlled trials.
- Explore the relationships between diet, nutritional status, and the development of chronic diseases and other health outcomes.
- Develop skills in analyzing epidemiological data using statistical software, including techniques for handling dietary data and adjusting for confounding variables.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60

Unit	Topic	No. of Lectures
I	**Basic Epidemiology Concepts and Methods** • Definition, scope and purpose of epidemiology • Basic measurements in epidemiology • Measurement of mortality, morbidity and disability – rates, ratios and proportions • Comparison of disease occurrence- absolute and relative comparisons	15

	• Epidemiologic study methods- observational and experimental studies • Observational epidemiology- descriptive and analytical studies – ecological, cross sectional, care-control and cohort • Experimental epidemiology- experimental and quasi experimental trials • Randomized control trials, Field trials and community trials • Population, sampling, sample size and power • Introduction to nutritional epidemiology: Definition, scope and significance of nutritional epidemiology in public health nutrition. • Design, steps in conducting the studies, data analysis and interpretation • Association and causation in epidemiology • Potential errors in epidemiologic studies • Measurement error and bias - Internal and external validity	
II	**Epidemiologic Approaches to Diet-Disease Relationships** • Measuring diet –disease associations- Type of measurement, time trends, correlation and regression, risk assessment • Design of nutritional epidemiological studies • Strengths and weaknesses of various designs in estimation of diet disease relationships, interpretation of epidemiologic research, multi variate relationship of diet and disease • Genetics in nutritional epidemiology- genetic variation and epigenetics in nutritional epidemiology- Gene diet interactions. • Ethical aspects of research in nutritional epidemiology	15
III	**Measurements of Exposure and Outcomes in Nutritional Epidemiology** • Nutritional exposures- Relevant direct and indirect measures of nutrition and health assessment • **Critical review of diet assessment methods-** assessment of food consumption at different levels, measurement errors, strengths and limitations, reproducibility and validity of methods measuring food consumption of individuals- 24 dietary recall, diet record and food frequency methods/Analysis of dietary patterns. Analysis and interpretation of dietary data. • **Nutritional status assessment:** Critical review of anthropometric and various direct measures pf nutritional status-clinical , biochemical, biophysical and measures of body composition. Sources of errors, strengths and limitations of various measures. Relevance and use of various indices and indicators of nutritional status for risk assessment. • **Biomarkers in nutritional epidemiology:** Uses and limitations of biomarkers as measures of nutritional status and in dietary validation studies.	15

	• **Physical activity assessment and interpretation:** Strength and weaknesses of subjective and objective methods. • Ecological assessment of nutritional status, socio-economic, demographic, cultural and political factors.	
IV	Role of Epidemiological Research in Development of Nutrition Related Policies and their Evaluation • Generating evidence for policy making, strengthening implementation of nutrition and health interventions and programmes, evaluation of the effectiveness of such interventions. Examples of use of epidemiological research data for improvement of nutrition and health interventions or national programmes.	15

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading :

• Bonita, R., Beaglehole, R., Kjellström T. (2006) Basic Epidemiology, 2nd Edition, WHO, 2006 http://whqlibdoc.who.int/publications/2006/9241547073_eng.pdf

• Moon, G., Gould, M. (2000). Epidemiology: An Introduction. Philadelphia, Open University Press

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• Gordis L. Epidemiology. 5th ed. Philadelphia, PA: Saunders Elsevier, 2013 • Aschengrau A., Seage G.R. (2014) Essentials of Epidemiology in Public Health. 3rd ed. Sudbury, MA: Jones & Bartlett.

• Willett, W. (2013) Monographs in Epidemiology and Biostatistics, Third Edition, Oxford University Press.

• Park, K. (2017) Park's Textbook of Preventive and Social Medicine, 24th ed. Jabalpur M/s. Banarsidas Bhanot

• Vir, S. (2011) Public health nutrition in developing countries, Woodhead Publishing India limited

• Gibney, M.J., Margetts, B.M., Kearney, J.M., Arab, L. (Eds) (2004) Public Health Nutrition. NS Blackwell Publishing

• Gibson, R. S. (2005). Principles of Nutritional Assessment. 2nd ed. Oxford University

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
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https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx

PAPER III : NUTRITION COMMUNICATION FOR HEALTH PROMOTION

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: V	Semester: X
Subject: Home Science		
Course Code:	**Course Title: NUTRITION COMMUNICATION FOR HEALTH PROMOTION**	Theory

Course Objectives:

It aims to equip students with the knowledge and skills necessary to effectively communicate nutrition information, promote healthy eating behaviors, and contribute to public health initiatives through strategic health promotion efforts.

Course outcome:

- Gain a thorough understanding of health promotion principles and the role of nutrition communication in promoting health and preventing disease.
- Learn key theories and models of communication and behavior change as they apply to nutrition and health promotion.
- Develop skills in crafting and delivering effective nutrition messages through various communication channels, including face-to-face, print, digital media, and social media.
- Learn to identify and analyze target audiences, understanding their needs, preferences, and barriers to adopting healthy eating behaviors.
- Develop cultural competence to tailor nutrition messages and interventions to diverse populations, considering cultural, social, and economic factors.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60

Unit	Topic	No. of Lectures
I	• Dietary guidelines for nutrition and health related concerns • National and international guidelines and their role in nutrition promotion. Critical appraisal of the current guidelines.	12

II	• Nutrition and behaviour inter-relationship Food and health behaviour, models/ theories of health behaviour, food choices, strategies for intervention at the ecological and individual level	12
III	**Social and Behaviour Change Communication for Nutrition and Health Promotion** • Concept and objectives of communication for behaviour change • Planning of communication strategies for social and behaviour change programme, • Communication needs analysis, stakeholders in nutrition promotion, developing nutrition education plan, identifying communication strategies/ approaches for nutrition and health promotion (e.g. social marketing), designing nutrition and health messages, selecting communication channels, developing and field testing of communication materials, designing training strategies for trainers and their capacity building. • Implementing social and behaviour change communication intervention: an overview • Evaluation of social and behaviour change communication programmes	12
IV	**Nutrition Advocacy** • Meaning, types, tools and techniques and advocacy planning. • Role of advocacy in nutrition policy formulation, preparation of policy briefs.	12
V	Ethics in nutrition and health communication • Significance of ethics in nutrition and health communication • Ethical Principles and concerns	12
Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.		

Suggested Reading :

• Gibney M.J., Margetts, B.M., Kearney, J.M., Arab, L. (Eds) (2004) Public Health Nutrition.NS Blackwell Publishing.

• Prochaska, K.L., The Transtheoretical Model of Behavioural Change, Shumaker SA(Eds).

• Robert C. Hornik , (2002) Public Health Communication: Evidence for BehaviourChange, Lawrence Erlbaum Associates, Inc.

• Ray E.B. and Donohew L. (1990) Communication and Health: Systems and Applications. Lawrence Erlbaum Associates, Inc.

• Maibach E. and Parrott R.L. (1995) Designing health messages: Approaches from Communication Theory and Public Health Practice. Sage Publications, Inc.

• Boyle M.A. (2016). Community Nutrition in Action: An Entrepreneurial Approach. 7th Edition. Brooks Cole. 98

• Vir S.C. (Ed). (2012) Nutrition-Health education and communication for improving women and child nutrition. Public Health and Nutrition in Developing Countries (Part II).Woodhead Publishing India Pvt. Ltd.

• USAID. Effective At-Scale Nutrition Social and Behavior Change Communication. MultiSectoral Nutrition Strategy 2014–2025 Technical Guidance Brief.

• McNulty J. (2013) Challenges and issues in nutrition education. Rome: Nutrition Education and Consumer Awareness Group, Food and Agriculture Organization of the United Nations. Available at: www.fao.org/ag/humannutrition/nutritioneducation/en/

• USAID (2010) Behavior Change Communication (BCC). Learning Resource Package. Facilitator's Guide.

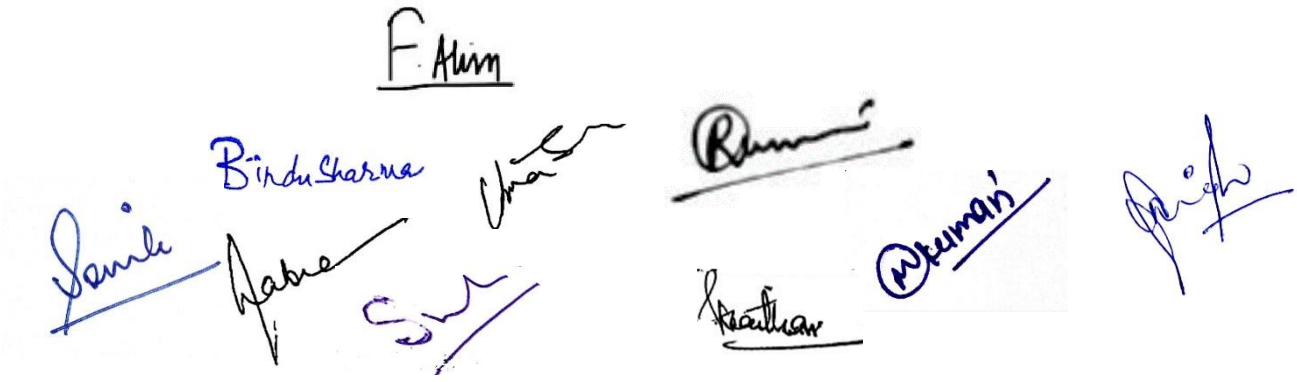
• O'Sullivan, G.A., Yonkler, J.A., Morgan, W., and Merritt, A.P. (2003) A Field Guide to Designing a Health Communication Strategy, Baltimore, MD: Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs, March 2003.

This course can be opted as an elective/ value-added course by the students of the following subjects:
Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses:
https://epgp.inflibnet.ac.in/
https://swayam.gov.in/
https://heecontent.upsdc.gov.in/Home.aspx



PAPER IV: PROBLEMS, POLICIES AND PROGRAMMES IN PUBLIC HEALTH NUTRITION (PRACTICAL)

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: V	Semester: X
Subject: Home Science		
Course Code:	**Course Title: PROBLEMS, POLICIES AND PROGRAMMES IN PUBLIC HEALTH NUTRITION**	Practical

Course Objectives: It aims to provide hands-on experience and skill development in nutrition communication, ensuring that students are well-prepared to effectively promote health and wellness through strategic and evidence-based communication efforts

Course outcome:

- Conduct research to identify and understand the target audience's needs, preferences, and barriers to healthy eating, using surveys, focus groups, and interviews.
- Develop clear, accurate, and culturally appropriate nutrition messages tailored to specific audiences, based on evidence-based guidelines and research findings.
- Design and produce engaging and informative educational materials such as brochures, posters, infographics, videos, and social media content.
- Practice delivering effective nutrition presentations and workshops to various audiences, using clear and persuasive communication techniques.
- Create and manage social media campaigns to promote healthy eating behaviors, using platforms like Facebook, Twitter, Instagram, and YouTube.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60 (2 hours per lecture)

Unit	Topic	No. of Lectures
I	Critical appraisal of ongoing national public health nutrition programmes.	12

II	Preparation of evaluation, monitoring and surveillance plans for public health nutrition programmes/ and their components – preparation of evaluation tools and their implementation.	12
III	Critically review studies in the field of nutritional epidemiology and do the following: • Identify research designs used, sampling, analyses and interpretation. • Identify applications of research evidence in the field of public health nutrition	12
IV	• Determine reliability and validity of an assessment tool • Estimate measurement error in anthropometric data • Interpret anthropometric data available from national and regional surveys	12
V	Review and document the changes in nutrition and health problems in vulnerable groups of the population in the last decade using secondary data (Indicators of mortality, morbidity, disability and nutritional status).	12

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading :

• Gibney M.J., Margetts, B.M., Kearney, J. M. Arab, I., (Eds) (2004) Public Health Nutrition, NS Blackwell Publishing.

• National Consensus Workshop on Management of SAM children through Medical Nutrition Therapy (2009)- Compendium of Scientific Publications Volume I and II. Jointly organized by AIIMS, Sitaram Bhartia Institute of Science and Research, IAP (Subspeciality chapter on Nutrition), New Delhi. Sponsored by DBT. • National Nutrition Policy, GoI. http://wcd.nic.in/sites/default/files/nnp_0.pdf

• Park, K. (2017) Park's Textbook of Preventive and Social Medicine, 24th edition. Banarsidas Bhanot Publishers.

• Vir, S.C. (Ed.). (2011). Public Health Nutrition in Developing Countries. Part 1 and 2. Woodhead Publishing India.

This course can be opted as an elective/ value-added course by the students of the following subjects:
Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

Suggested equivalent online courses:
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PAPER V: NUTRITION COMMUNICATION METHODS

Programme /Class: : M.Sc FOOD & NUTRITION (NEP)	Year: V	Semester:X
Subject: Home Science		
Course Code:	**Course Title: NUTRITION COMMUNICATION METHODS**	Practical

Course Objectives:

It aims to equip students with the skills and knowledge necessary to effectively communicate nutrition information, promote healthy behaviors, and contribute to public health initiatives through strategic and evidence-based communication methods.

Course outcome:

- Learn and understand the foundational theories and models of communication and their application to nutrition and health promotion.
- Develop skills to create clear, accurate, and impactful nutrition messages tailored to different audiences.
- Understand how to use various media channels, including print, broadcast, and digital media, to effectively communicate nutrition information.
- Gain the ability to analyze and segment audiences to tailor nutrition messages that resonate with specific groups.
- Develop skills in designing and producing engaging and informative educational materials, such as brochures, posters, infographics, videos, and online content.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60 (2 hours per lecture)

Unit	Topic	No. of Lectures
I	• Planning of communication strategies for public health nutrition problems among vulnerable groups in the community -field testing of messages, materials and methods.	30

II	• Review of communication strategies being used in any one public health nutrition programme in the community.	30

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading :

• Robert C. Hornik , (2002) Public Health Communication: Evidence for behaviour Change, Lawrence Erlbaum Associates, Inc.

• Ray E.B. and Donohew L. (1990) Communication and Health: Systems and Applications. Lawrence Erlbaum Associates, Inc.

• Maibach E. and Parrott R.L. (1995) Designing health messages: Approaches from Communication Theory and Public Health Practice. Sage Publications, Inc.

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Internal assessment/tests
- Attendance

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PAPER VI : DISSERTATION/ INTERNSHIP

Programme /Class: M.Sc FOOD & NUTRITION (NEP)	Year: V	Semester:X
Subject: Home Science		
Course Code:	**Course Title: DISSERTATION/ INTERNSHIP**	Project

Course Objectives: It aims to equip students with the necessary skills and experience to undertake independent research, contribute to advancing knowledge in home science, and prepare for future academic or professional pursuits.

Course outcome:

- Develop advanced research skills, including literature review, research design, data collection, analysis, and interpretation.

- Identify and define research problems and questions within the field of home science that are relevant and significant.

- Apply critical thinking and analytical skills to evaluate existing literature and research findings related to home science topics.

- Gain practical experience in collecting and analyzing data using appropriate research methods and statistical techniques relevant to home science.

- Collaborate effectively with peers, faculty, and industry professionals during the research process, and communicate research findings to diverse audiences.

- **Reflection and Continuous Improvement**: Reflect on the research experience, receive feedback from peers and supervisors, and identify areas for continuous improvement in research skills and knowledge.

Credits:4	Core Compulsory
Max. Marks: 30+70=100	Min. Passing Marks : 36

Total No. of Lectures – 60 (1 hour per lecture)

Unit	Topic	No. of Lectures
I	**TECHNICAL WRITING & SEMINAR** (Seminar to be assessed by three teachers) (Technical writing to be assessed by Continuous Evaluation) **Objectives:** To understand the nuances of scientific writing, develop skills in collation and presentation of scientific information and learn the process of developing a research proposal/ project proposal **Student will be able to:** 1. Demonstrate knowledge of scientific writing method and styles 2. Develop a research design on a topic relevant to their field 3. Prepare a systematic literature review on a select topic 4. Present a seminar of the literature review **The practical will have three components**. • Based on option of students for either dissertation or project work, due emphasis will be provided on Research Design / Project proposal • **Under the guidance of supervisor allocated prepare a research design / project proposal,** • Skills in Technical Writing • Learn the nuances of select technical writing styles/ guides • Analyze technical posters of researches in the fields • Analyze dissertations, research reports systematic reviews/ secondary research and project evaluation reports and their presentations • **Review of Literature & Seminar** • Prepare a literature review on a select topic using an approved style guide • Conduct Plagiarism check of document prepared • Present an oral seminar	60

	OR **INTERNSHIP** (To be assessed by a Board of three teachers) **Objectives:** To gain hands on experience of working in various institutions related to the area of Food and Nutrition. The students could work with NGOs / Government agencies / International agencies/ Hospitals / Food Industries etc. They would be required to present a report and a seminar of their Internship in their Department	

Teaching Learning Process: Class discussions/ demonstrations, Power point presentations, Class activities/ assignments, Field visits., Internship, etc.

Suggested Reading :

- Alley, M. (2018) The Craft of Scientific Writing. New York: Springer.
- Bernard, H.R. (2000). Social Research Methods: Qualitative and Quantitative Approaches. Thousand Oaks, CA: Sage
- Black, J.A. and Champion, D.J. (1976). Methods and Issues in Social Research. NewYork: John Wiley and Sons.
- Blaxter, L., Hughes, C, and Tight, K. (1999). How to Research. New Delhi: Viva books.
- Blum, D., Knudson M., and Henig, R. M. (2005) Field Guide for Science Writers: The Official Guide of the National Association of Science Writers. USA; Oxford University Press. http://www.nasw.org/field-guide
- Elmes, D.G., Kanowitz, B.H. and Roediger, H.L. (1989). Research Methods in Psychology (Third Edition). New York: West Publishing Company.
- Katz, M. (2009) From Research to Manuscript: A Guide to Scientific Writing (2nd Ed). New York : Springer
- http://www.apastyle.org/
- http://www.citethisforme.com/guides EL

This course can be opted as an elective/ value-added course by the students of the following subjects: Open for all

Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
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