



**Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore**  
**Shri Vaishnav Institute of Home Science**  
**Choice Based Credit System (CBCS) in Light of NEP-2020**  
**M. Sc Food and Nutrition Sem II (2022-2024)**

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
MFSN 201	CC	Community Health and Nutrition	60	20	20	0	0	3	0	0	3

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

\***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

**Course Educational Objectives (CEOs): The Students will -**

**CEO1:** understand community at large, its health indices, prevalent nutritional problems their assessment, identification of at-risk groups and policy planning.

**CEO2:** gain knowledge about community nutrition services, NNP, other polices and community participatory leaning.

**Course Outcomes (COs): Student should be able to-**

**CO1:** acquire knowledge about community health indicators, methods of nutritional assessments and dietary surveys to prevent nutritional problems.

**CO2:** understand various national prophylaxis programs and agencies (government and non-government) and their roles in community development.

**CO3:** gain awareness of about NNP, malnutrition, government guidelines, ministries involved, food security and economics.

**CO4:** develop skills for Policy planning and participatory leaning techniques for community-based programs.

**Syllabus**

**UNIT I**

- Concept of community, Community development, Social and cultural perspectives in relation to food preferences and health.
- Nutritional epidemiology, Indices of population health status- birth rates, mortality rates, parity, sex ratio, life expectancy etc. Case control and Cohort studies.
- Nutritional Assessment and Methods of identification of Nutritional Problems: Salient features, Techniques of dietary survey, limitations and interpretation of data, anthropometrical, biochemical, clinical and radiological techniques - limitations and interpretation.

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### UNIT II

- Assessment of Nutritional Status: developmental milestones: Gomez and Water low classifications of growth. Standard norms for evaluation of growth.
- Growth charts. Identification of Vulnerable or at-risk groups. Nutritional problems of the Indian community: etiology, Government intervention / combat strategies for low-birth-weight infants, protein- energy malnutrition, kwashiorkor and marasmus. Vitamin A deficiency, nutritional anemia, iodine deficiency disorders, endemic flourosis, lathyrism.

### UNIT III

- Community nutrition services: role of National Nutrition Monitoring Bureau. National Sample Survey in assessment of geographical distribution of dietary patterns in India.
- National and International Services. Governmental and Non-Governmental organizations. Health care delivery systems in rural and urban India.
- Immunization. Supplementary feeding programs, reasons for their success and failure. I.E.C. activities in relation to Nutrition. Panchayati Raj Institutions and Nutrition services. Nutrition Education. Objectives, channels, methods and evaluation of communication.

### UNIT IV

- Nutrition and Policy Planning: National nutritional policy and the State nutritional policy: development, aims, Government guidelines, policies and ministries involved.
- Public distribution system and administration. Food Production in relation to needs of the country, food security, food economics. Global perspectives in malnutrition. Global environmental problems: Global warming and its impact on agriculture. World food problems: prevalence, indicators of economic and social statistics of nations and combat strategies.

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#### UNIT V

- Participatory techniques for community-based programs: participatory learning, action and techniques.
- Timeline, seasonal calendars, diagramming, focus group discussions. Transect walks and observation. Ranking, scoring and matrices. Participatory monitoring and evaluation.

#### Textbooks:

- Gibson, R.S. (2010). *Principles of Nutritional Assessment*. Oxford University Press. NewDelhi.
- Mann, S.K., Sangha, J.K., Mehta, U. & Jain, R. (2019). *Manual on Community Nutrition*. College of Home Science, PAU, Ludhiana.
- Obert, J.C. (2006). *Community Nutrition*. Mac Millan. New York.
- Park, K. (2000). *Textbook of Preventive and Social Medicine*. Banarsidas Bhanot Publishing Jabalpur, India.
- Shukla, P.K. (1982). *Nutritional Problems of India*. Prentice Hall of India

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MFSN 202	CC	Dietetics Therapeutic Nutrition	60	20	20	0	0	3	0	0	3

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**Course Educational Objectives (CEOs): The Students will -**

**CEO1:** comprehend about life cycle nutrition, RDA calculations for various agegroups, clinical manifestation and associated complication with various diseases.

**CEO2:** gain knowledge about therapeutic nutrition, dietary management for prevention of diseases

**Course Outcomes (COs): Student should be able to-**

**CO1:** develop profound knowledge of planning menus involving judicious modification of macro and micronutrients for various physiological and pathological conditions.

**CO2:** comprehend for various types of clinical diets and food-based home remedies for managing co – morbidity.

**CO3:** enhance knowledge about various febrile and gastrointestinal disorders and their managements.

**CO4:** develop profound understanding for life threatening diseases like Diabetes Miletus,CVD and Renal Disorder.

**CO5:** learn the management of the biliary diseases.

**Syllabus**

**UNIT I**

Nutrient requirements and diet plans for different stages of life: pregnancy, lactation, infancy, childhood, adolescence, adulthood and geriatric group.

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### UNIT II

- In relation to physical activity: Diets for laborers and athletes. Nutrition for weightmanagement: Underweight, Overweight and obesity.
- Introductory concepts of therapeutic nutrition: normal diets, dietary modifications- soft diets, liquid diets, total parenteral nutrition, other therapeutic diets. Food-based home remedies: evaluation as scientific facts or food fads.

### UNIT III

- Viral fevers, typhoid and tuberculosis: classification, etiology, metabolic aberrations, clinical manifestations, complications, dietary management and counseling.
- Febrile conditions such as Gastrointestinal diseases such as diarrhea, constipation, gastritis, flatulence, peptic ulcer. Malabsorption syndromes: Coeliac disease. Tropical sprue, Lactose intolerance.

### UNIT IV

- Diabetes (NIDDM, IDDM, GDM): classification, etiology, metabolic aberrations, clinical manifestations, complications, dietary management and counseling.
- Cardiovascular diseases: Atherosclerosis, hypertension, hypercholesterolemia, hyperlipoproteinemia, congestive heart failure, myocardial infarction.
- Renal diseases: Nephrotic syndrome. Acute glomerulonephritis. Acute renal failure. Chronic renal failure.

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#### UNIT V

- Biliary diseases: of liver, Hepatitis. Cirrhosis, Hepatic coma. of gallbladder, Gall stones, Cholelithiasis. of pancreas, Pancreatitis.: Classification, etiology, metabolic aberrations, clinical manifestations, complications, dietary management and counseling.

#### Textbooks:

- Bamji, M.S. Rao, N.P & Reddy, V. (2006). *Textbook of Human Nutrition*. Oxford & IBH Publishing Co. (P) Ltd. New Delhi.
- Eastwood, M. A. & Passmore, R. (2017). *Human Nutrition and Dietetics*. ELBS Churchill Livingstone, London.
- Garrow, J.S. et al. (2001). *Nutrition and Dietetics*. Churchill and Livingstone, Edinburgh.
- Khanna, K. (2007). *Textbook of Nutrition and Dietetics*. Elite publishing house, New Delhi.
- Shils, M.E. (2006). *Modern Nutrition in Health and Disease*. Lippincott, Williams & Williams, USA.

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MFSN 203	SEC	Post Harvest Technology	60	20	20	0	0	3	0	0	3

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

\***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

**Course Educational Objectives (CEOs): The student will:**

**CEO1:** Ingrain the understanding of Pre & post-harvest management of fruits and vegetables.

**CEO2:** comprehend about principles and technical aspects of processing of fruits and vegetable storage, preservation and canning.

**Course Outcomes (COs): Students will be able to:**

**CO1:** acquainted the details of fruits, vegetables and post harvesting processes and potential causes of post-harvest losses.

**CO2:** develop profound knowledge of Pre harvest factors affecting quality, respiration, storage and preservation.

**CO3:** familiarize with fermentation process and skillful in processing and preservation offruit juices, candy and develop tomato products.

**CO4:** adapt for concept and methods of canning and dehydration.

**Syllabus**

**UNIT I**

- Introduction to Fruits and Vegetables: Classification of fruits and vegetables, general composition, enzymatic browning and its prevention.
- Importance of post-harvest processing of fruits and vegetables, extent and possible causes of post harvest losses.

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MFSN 203	SEC	Post Harvest Technology	60	20	20	0	0	3	0	0	3	

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### UNIT II

- Pre-harvest factors affecting postharvest quality, maturity and ripening.
- Respiration and factors affecting respiration rate.
- Storage: ZECC, coldstorage, CA, MA, and hypobaric
- Value addition concept, Principles and methods of preservation of agricultural produce.

### UNIT III

- Fruit Beverages: Introduction, fermented and non-fermented beverages.
- Processing of fruit juices, Jams, Jelly, Marmalades, Squashes, Preserve and Candy: processing and quality control.

### UNIT IV

- Tomato products: Selection of tomatoes, pulping & processing of tomato juice, tomato puree, paste, ketchup, sauce and soup.

### UNIT V

- Canning: Selection of fruits and vegetables, process of canning, containers of packing, lacquering, syrups and brines.
- Drying/ Dehydration of fruits and vegetables – Concept and methods.

### Text Books:

- Siddapa, G.S. (1986)., *Preservation of Fruits and Vegetables*, ICAR Publication
- Van Loesecke HW (2018), *Food Technology Series Drying and Dehydration of foods*. Allie Scientific Publishers.
- Salikhe D K and Kadam SS (1995), *Handbook of fruit science and technology*.

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MFSN 204 E1	DSE	Food Microbiology and Food Safety	60	20	20	0	0	3	0	0	3

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

\***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

**Course Educational Objectives (CEOs): The students will:**

**CEO1:** acquaint with different groups of micro-organisms associated with food and food borne diseases, their activities, destruction and detection in food.

**CEO2:** learn the significance of food safety and protection of food against the disease outbreaks caused by various microorganisms and contaminants.

**Course Outcomes (COs): The students be able to:**

**CO1:** understand microbiology in depth with respect to definition types importance and scope

**CO2:** acquainted with food spoilage, its potential reasons and physical and chemical usage in microbes' destruction.

**CO3:** develop profound understanding of genetically engineered organisms, probiotics and fermented food and its health benefits.

**CO4:** be sentient of all aspects of food safety and quality control.

**Syllabus**

**UNIT I**

- Microbiology: definition, types, scope of Food Microbiology.
- Bacteria, Fungi, Yeast, Viruses, Bacterial groups based on their morphology: Gram +ve/Gram –ve bacteria, Motile/Non-motile bacteria, Sporulating/Nonsporulating bacteria. Bacterial groups based on their physiological growth factors: Temperature, pH, water activity, availability of oxygen.
- Fungi and Yeast: General features & their importance in food Microbiology.

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MFSN 204 E1	DSE	Food Microbiology and Food Safety	60	20	20	0	0	3	0	0	3

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### UNIT II

- Food Spoilage and Preservation, Spoilage in Milk, Bread, Canned food, Vegetables and fruits, Fruit juices, Meat, Eggs and Fish.
- Physical and chemical means used in destruction of microbes: sterilization, disinfection, role of heat, filtration and radiation in sterilization, use of chemical agents-alcohol, halogens and detergents.

### UNIT III

- Microorganisms in Human Welfare: genetically engineered organisms, probiotics and single cell proteins. Dairy products (cheese and yoghurt) and traditional Indian fermented foods and their health benefits

### UNIT IV

- Food safety and Quality Control I: Public health hazards due to microbial contamination of foods: Important food borne infections and intoxications with its symptoms, mode of transmission and methods of prevention.

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#### UNIT V

- Food safety and Quality Control II: Assessing the microbiological quality of food: indicator organisms, microbiological standards, GMP & HACCP in food processing.
- Food standards and laws: Codex Alimentarius, FSSAI, HACCP, GMP, GHP, USFDA, ISO 9000, ISO 22000. Introduction of BIS/IS, FSSA, FSSC, FPO, MPO, MMPO and Agmark.

#### Textbooks:

- Banwart GJ.(1987). *Basic Food Microbiology* . CBS Publishers and Distributors.
- Frazier WC, Westhoff DC. (1998). *Food Microbiology*. 4th ed. Tata McGraw HillPublishing Co. Ltd.
- Jay JM, Loessner DA, Martin J. (2 005) *Modern Food Microbiology*. Springer
- Pelczar MJ, Chan ECS, Krieg N. (1993) *Microbiology*. Tata McGraw-Hill PublishingCo. Ltd.
- Prescott LM, Harley JP, Klein DA. (2008) *Microbiology*. 6th ed. WMC Brown publishers.

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MFSN 204 E2	DSE	Food Packaging	60	20	20	0	0	3	0	0	3

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

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**Course Educational Objectives (CEOs): The Students will:**

**CEO1:** acquire knowledge for basic concepts and significance of packaging and different forms of packaging.

**CEO2:** understand recent trends in food packaging and different food packaging material.

**Course Outcomes (COs): Students should be able to:**

**CO1:** develop understanding for packaging, its essentials, requirements, importance and consequences.

**CO2:** inculcate knowledge regarding packaging types and properties.

**CO3:** developed profound understanding for packaging machinery.

**CO4:** distinguish the packaging material for raw and processed foods.

**CO5:** update with recent trends in food packaging.

**Syllabus**

**UNIT I**

- Basic concept of packaging, definition, importance and scope of packaging foods, criteria for packaging foods.
- Current status and trends in food packaging. Origin of packaging materials; different types; properties, advantages and disadvantages of each material- glass containers, metal cans- tinplate, aluminium, TFS; aluminium foil.
- Cellulose based materials- paper, paperboard, corrugated fibreboard pouches- bags and boxes.

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- Plastic films- polyethylene, polypropylene, polyamides, polyester, PVC, PVDC, PVA,EVOH, polycarbonates, cellophane, inomers, copolymers, phenoxy, acrylic and polyurethanes.
- Laminates- objectives, types, methods of lamination. Containers- bags, pouches, retort pouch. Properties of packaging films- mechanical, sealing and barrier. Advantages and disadvantages of each packaging material.

### UNIT III

- Packaging machinery: Bottling, can former, form fill and seal machines, bags- their manufacturing and closing, vacuum packs unit, shrink pack unit, 'tetrapak' unit.

### UNIT IV

- Packaging requirements and their selection for raw and processed foods for meat, fish, poultry, eggs, milk and dairy products, fruits and vegetables, cereal grains and baked food products, beverages, snacks, etc.
- Packaging material testing: Global and specific migration, WVTR, GTR, bursting strength,

### UNIT V

- Recent trends in food packaging: vacuum packaging, modified atmospheric packaging, shrink packaging, retort pouch packaging, aseptic packing, active packaging, intelligent packaging, smart packaging.
- Advanced packaging technologies, alternative packaging systems to plastic material, nanotechnology. Packaging laws and regulations

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**M. Sc Food and Nutrition Sem II (2022-2024)**

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University	Teachers Assessment				
MFSN 204 E2	DSE	Food Packaging	60	20	20	0	0	3	0	0	3

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

\***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks

**Text Books:**

- Ahvenainen, R. (Ed.) 2003. *Novel Food Packaging Techniques*. CRC Press. Coles, R., D.
- McDowell and M.J. Kirwan (Eds). 2003. *Food Packaging Technology*. CRC Press.
- Gopakumar, K. (1993). *Fish Packaging Technology: Materials and Methods*. Concept Publishing Company, New Delhi.

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MFNL 205	CC	Food and Nutrition Lab	0	0	0	90	60	0	0	4	2

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**Course Educational Objectives (CEOs): The student will –**

**CEO1:** acquired knowledge for various survey techniques, measure anthropometric measurements, BMI calculation.

**CEO2:** recognize signs and symptoms of various deficiency diseases and develop tool for Nutrition Education.

**CEO3:** learn post-harvest experimentation.

**Course Outcomes (COs ): Student will be able to-**

**CO1:** develop questionnaire to assess socio-economic measures and per capita food availability by using standard food measurements.

**CO2:** acquainted with anthropometric measurements, BMI and various growth charts.

**CO3:** identified signs and symptoms of common macronutrient and micronutrient deficiencies.

**CO4:** develop IEC tool for nutrition education like audio visual aids and seasonal calendars.

**CO5:** learn computation and tabulation of indices used in assessing the status of community nutrition.

**List of Practical's:**

**A. Dietetics and Therapeutic Nutrition**

1. Diet and Nutrition Survey techniques:
2. Development and pilot testing of a questionnaire for socio-economic measures.
3. Conduction of diet survey for the assessment of per capita food availability by using standard bowl measurements and preparation of food frequency questionnaire.

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MFNL 205	CC	Food and Nutrition Lab	0	0	0	90	60	0	0	4	2

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4. Anthropometric survey techniques. Measurement and significance of height, weight, mid upper arm circumference (MUAC), waist-hip ratio, chest circumference, head circumference, sitting height / standing height ratios.
5. Calculation of health indicators.
6. Use of growth charts in assessing the growth pattern of children.
7. Calculation of Body Mass Index (BMI) of the class and categorizing them into its respective grades.
8. Identification and recognition of signs and symptoms of common macronutrient deficiencies like Protein Energy malnutrition (Kwashiorkar and Marasmus).
9. Identification and recognition of signs and symptoms of common micronutrients such as anemia, dermatitis, xerophthalmia, bitot's spot etc.
10. Techniques used in Community Nutrition and Epidemiology:
11. Preparation of IEC tools for nutrition education and use of audio visual aids in community.
12. Preparation of seasonal calendars and time line charts.
13. Conduction of a Focus group discussion
14. Computation and tabulation of indices used in assessing the status of community nutrition (Morbidity rate, Mortality rates, parity, Hospital Prognostic Index etc.)

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MFNL 205	CC	Food and Nutrition Lab	0	0	0	90	60	0	0	4	2

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**B. Post harvest technology practical's.**

1. Experiment on control of enzyme activity, enzyme inactivation in fruits and vegetables.
2. Estimation of acidity, total solids of different foods – Squashes, syrups and juices.
3. Dehydration of fruits and vegetables and its effect on color texture and rehydration ratio.
4. New product development using principles of preservation of fruits and vegetables by low temperature/heat//salt and sugar.
5. Processing of tomato products.
6. Processing of jams, jellies and marmalades.

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MFNV 206	CV	Comprehensive Viva	0	0	0	60	40	0	0	0	2

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**Note: Comprehensive Viva of the candidates in presence of subject expert and faculty members.**

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