



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 (2021-2023)

| 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, lathyrisism.

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, combat strategies

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| MFSN 202 | CC | Dietetics Therapeutic 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: comprehend about life cycle nutrition, RDA calculations for various age groups, 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.

UNIT II

In relation to physical activity: Diets for laborers and athletes. Nutrition for weight management: Underweight, Overweight and obesity.

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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.

Text Books:

- Antia, F.P. & Abraham, P. (1997). Clinical Dietetics and Nutrition 4th Ed., Oxford University Press, New Delhi.
- Bamji, M.S., Rao, N.P & Reddy, V. (1996). Textbook of Human Nutrition. Oxford & IBH Publishing Co. (P) Ltd. New Delhi.
- Eastwood, M. A. & Passmore, R. (1987). Human Nutrition and Dietetics. 8th Ed. 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.
- Robinson, C.H. & Lawler, M.R. (1982). Normal and Therapeutic Nutrition. Oxford & IBH Pub. Co. New Delhi.
- Shils, M.E. (2006). Modern Nutrition in Health and Disease. Lippincot, Williams & Williams, USA.
- Whitney, E.R & Rodney Roltes, S. (1996) Under Standing Nutrition. West Publishing Company, New York, USA.

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

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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 of fruit juices, candy and develop tomato products.

CO4: adept 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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UNIT II

Pre-harvest factors affecting postharvest quality, maturity, ripening and changes occurring during ripening; Respiration and factors affecting respiration rate. Storage (ZECC, cold storage, 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 (selection, juice extraction, desecration, straining, filtration and clarification), preservation of fruit juices (pasteurization, chemically preserved with sugars, freezing, drying, tetra-packing, carbonation) 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, osmotic drying.

Text Books:

- Siddapa, GS (1986)., Preservation of Fruits and Vegetables, ICAR Publication
- Van Loesecke HW (1998), 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(A) | DSE | Food Microbiology and Food Safety | 60 | 20 | 20 | 0 | 0 | 3 | 0 | 0 | 3 |

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***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.

An introduction to microbial world: 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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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, ISO 14000.bn Introduction of BIS/IS, FSSA, FSSC, FPO, MPO, MMPO and Agmark.

Text Books:

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

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| MFSN 204(B) | DSE | Food Packaging | 60 | 20 | 20 | 0 | 0 | 3 | 0 | 0 | 3 |

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***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: 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 packing 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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UNIT II

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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| MFSN 204(B) | 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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M. Sc Food and Nutrition Sem II (2021-2023)

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

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

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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

CO6: acquired skill for experimentation and estimation for various Post Harvest processes.

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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| | | | End Sem University Exam | Two Term Exam | Teachers Assessment | End Sem University Exam | Teachers Assessment | | | | |
| MFNL 205 | CC | Food and Nutrition Lab | 0 | 0 | 0 | 90 | 60 | 0 | 0 | 4 | 2 |

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

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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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| | | | Theory | | | Practical | | L | T | P | CREDIT |
| | | | End Sem University Exam | Two Term Exam | Teachers Assessment | End Sem University Exam | Teachers Assessment | | | | |
| MFNV 206 | CV | Comprehensive Viva | 0 | 0 | 0 | 60 | 40 | 0 | 0 | 0 | 2 |

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

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

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