Lalit Narayan Mithila University

Kameshwaranagar, Darbhanga-846004

SYLLABUS

POST GRADUATE PROGRAMME

MA HOME SCIENCE (FOOD AND NUTRITION)

The Post Graduate programme in Home Science (Food and Nutrition) plays a vital role in promoting the quality of life of individuals and communities.

Therefore, the syllabus of the MA Courses in Home Science (Food and Nutrition) being conducted by Lalit Narayan Mithila University, Darbhanga has been designed to provide the students intensive and extensive theoretical and experiential learning. The Course is under the Faculty of Social Sciences and shall be conducted with the regulations as given below:

- The duration of MA Home Science (Food and Nutrition) Course shall be of two academic sessions/four semesters. Each Semester shall be of 16 to 18 weeks of actual study.
- Each academic session shall consist of two Semesters-- Semesters I & III: from July to December and Semesters II & IV: from January to June.
- The MA Course shall consist of 16 Papers spread over four Semesters with four Papers in each semester carrying 100 marks each paper. The 15th Paper is a special Paper with three options to choose one from them. The entire curriculum, thus, shall be of total of 1600 Marks.
- The performance of a student in each paper shall be assessed on the basis of a Continuous Internal Assessment (CIA) of 30 marks and the End of Semester Examination (ESE) consisting of 70 marks.
- There shall be a continuous internal assessment of the student's performance by teachers of the Department during the period of a Semester. The break –up of 30 marks allotted for the CIA is as below:
  a. Two mid-Semester written Test of one Hour Duration conducted by the Department……15 Marks
  b. Seminar/Quiz……...05 Marks
  c. Assignment……..05 Marks
  d. Punctuality and conduct……..05 Marks

  Total 30 Marks

- The End of Semester Examination shall be conducted by the University. The two Mid-Semester Tests and practical examinations will be conducted by the Department.
- The End of Semester Examination shall be named as follows:
  a. MA Part I…… Ist Semester and IInd Semester Exams.
  b. MA Part II ……IIIrd and IV th Semester Examination
- Syllabus for each Paper shall be divided into 5 units.
- For the ESE, the Question Paper for each of the Paper shall follow the following pattern;-

Part-A

Ten objective type Questions 10x2=20 Marks

(Two Questions from each unit)

Part-B

Five short Answer Questions (four to be answered)...4x5=20 Marks

(One Questions from each unit)

Part-C

Three long answer Questions out of five ……..3x10=30 Marks

to be answered(one question from each unit)

- There shall be a Practical Paper of 100 Marks in each of the Semester. The Practical Paper of the Semester shall comprise of 50 Marks for CIA and 50 Marks for End of Semester Examination (ESE). The breakup of CIA is as:
  a. Performance……30 Marks
  b. Punctuality and Conduct……10 Marks
  c. Viva-Voce……..05 Marks
  d. Class Record……..05 Marks
- There shall be two Papers of a Foundation Course, one each in Semester I and Semester III . the Foundation Course is mandatory, but Grade Points will not be considered as part of SGPA and CGPA. It will be marked as 'S'(Satisfactory) for obtaining 45 or above and less than 45 Marks will be considered as Fail for the purpose of grading.
- The following grading system shall be used:-

Letter Grade	**Percentage Range**	**Numerical of Letter Grade**	**Description of Grade**
A(+)	80 and above	9	Excellent
A	70-79	8	Very Good
A-	60-69	7	Good
B+	52-59	6	Above Average
B	46-51	5	Average
B(-)	40-45	4	Satisfactory
C(+)	35-39	3	Below Average
C	30-34	2	Unsatisfactory
C(-)	Below 30	1	Very Unsatisfactory

- The term 'Credit' means weightage given to a paper in relation with the instructional hours assigned to it. One Credit mentioned here will consist of ten hours of instruction. Each Paper of the Course has been given required number of Credits.

L N MITHILA UNIVERSITY, DARBHANGA

POST GRADUATE PROGRAMME

MA HOME SCIENCE (FOOD AND NUTRITION)

PAPER	SUBJECT	MARKS	CREDIT	PAPER CODE
SEMESTER-I				
Paper-1	Statistics and Research Principles	70+30	5(5+0)	HSC 511
Paper-II	Applied Physiology	70+30	5(5+0)	HSC 512
Paper-III	Nutrition for Children's Health and Disease	70+30	4(4+0)	HSC 513
Paper-IV	Field and Laboratory Practical	50+50	6(0+6)	HSC 514
	Total	**400**	**20(14+6)**	
SEMESTER-II				
Paper-V	Statistics and Research Methodology	70+30	5(5+0)	HSC 521
Paper-VI	Advanced Applied Physiology	70+30	5(5+0)	HSC 522
Paper-VII	Child and Maternal Nutrition	70+30	4(4+0)	HSC 523
PaperVIII	Field and Laboratory Practical	50+50	6(0+6)	HSC 524
	Total	**400**	**20(14+6)**	
SEMESTER-III				
Paper-IX	Food Science	70+30	5(5+0)	HSC 531
Paper-X	Therapeutic Nutrition	70+30	5(5+0)	HSC 532
Paper-XI	Problems in Human Health and Nutrition	70+30	4(4+0)	HSC 533
Paper-XII	Field and Laboratory Practical	50+50	6(0+6)	HSC 534
	Total	**400**	**20(14+6)**	
SEMESTER-IV				
Paper-XIII	Advanced Food Science	70+30	5(5+0)	HSC 541
Paper XIV	Advanced Human Nutrition	70+30	5(5+0)	HSC 542
Paper-XV	**Special Paper**: Public Nutrition **or** Geriatric Nutrition **or** Advances in Food Microbiology	70+30	4(4+0)	HSC 543
PaperXVI	Laboratory Practical	50+50	6(0+6)	HSC 544
	Total	**400**	**20(14+6)**	
Grand Total		**1600**	**80(56+24)**	

MA Part I

SEMESTER I

Paper-I Statistics and Research Principles Code: HSC511

Credits: 5(5+0)

Full Marks: 70 ESE+30CIA

Contents

Unit **1:** Definition and identification of a research problem: theory, Hypothesis, basic assumption, limitation and delimitation of problem

Unit **2:** Types of Research: Historical, Survey, experimental, case study, **s**ocial research, participatory research.

Unit **3**: Basic Principles of Research Design: its purpose, its fundamental and its applied aspects.

Unit **4:** Application of Statistic principles in Research: Sampling, Analysis of Data, Method and technique of data collection.

Unit **5**: Role of Statistics and research in Home Science Discipline: objective of research, Explanation, control and prediction

MA Part I

SEMESTER I

Paper-II Applied Physiology Code :HSC512

Credits: 5(5+0)

Full Marks: 70 ESE+30CIA

Contents

Unit **1.** Circulatory System :

Structure and function of heart and blood vessels regulation of cardiac output and blood pressure, Heart-failure, hyper tens.

Unit **2.** Excretory System:

Structure and function of Nephron , urine, formation, role of kidney in maintaining the pH of blood.

Unit **3**. Immune System :

Cell mediated and humoral immunity, Activation of WBC and production of antibodies, Role in information and defense.

Unit **4**. Reproduction:

Menstrual cycle, spermatogenesis, physiological change in pregnancy.

Unit **5.** Respiratory System:

Review of structure and function, role of lungs in the exchange of gases, Transport of oxygen and Carbon dioxide , cardio-respiratory response to exercise

MA Part I

SEMESTER I

Paper-III Nutrition for Children's Health and Disease

Code :HSC513

Credits: 4(4+0)

Full Marks: 70 ESE+30CIA

Contents

Unit **1.** Current Nutrition and Health Status of children in India: Indicators of health and nutritional status (IMR, child mortality rates, anthropometric measurements.

Unit **2**. Growth and development of Children: during --infancy, Childhood and Adolescence, infant physiology and the pattern of Low Birth Weight Infants

Unit **3**. Nutrition in infancy: nutritional requirement during infancy, Feeding of infants, breast feeding and its importance, artificial feeding,

Unit.**4**. Supplementary foods for Children: infant weaning foods, weaning practices in community and its advantages and disadvantages.

Unit **5**. Nutritional Disorder in infancy and Childhood: Deficiency disease, nutrition in infection, diseases of malnutrition and under nutrition.

MA Part I

SEMESTER I

Paper-IV Field and Laboratory Works

Code :HSC514

Credits: 6(0+6)

Full Marks: 50 ESE+50CIA

Unit	Contents
Unit 1.	Demonstration and working principle of (a) Centrifuge (b) Homogenizer (c) Top Pan Balance (d) Photometer (e) Kymograph
Unit **2**.	Understanding the separating techniques of (a) Chromatography (b) Electrophoresis
Unit **3**.	Estimate of energy requirements (a) 5 years child (b) Lactating mother (c) Office Worker.
Unit **4.**	Nutrition Evaluation (Survey report on any one of the following) (a) IDD (b) Vitamin-A (c) Vitamin-C (d) Iron (e) Calcium (f) Fluorine
Unit **5.**	Microbial analysis of any one of the following (a) Any one food item (b) Milk (c) Water

MA Part I

SEMESTER II

Paper-V Statistics and Research Methodology Code :HSC521

Credits: 5(5+0)

Full Marks: 70 ESE+30CIA

Contents

Unit **1**. Statistics in Research: measure of central tendency (mean, median, mode), measure of variability (range, average deviation, standard deviation)

Unit **2**. Data Gathering Instruments: observation, questionnaire, interview, home visits, reliability and validity of measuring instruments.

Unit **3.** Pie Chart, Histogram, Normal Distribution

Unit **4**. Correlation-Types, merits and demerits.

Unit **5.** Writing a Research Proposal.

MA Part I

SEMESTER II

Paper-VI Advanced Applied Physiology Code :HSC522

Credits: 5(5+0)

Full Marks: 70 ESE+30CIA

Unit Contents

Unit **1**. . Cell Structure and Function :

* Levels of cellular organization and function- organelles, tissue, organs and systems.
* Brief reviews- cell membrane, transport across cell membranes and intercellular communication, Regulation of cell multiplication.

Unit **2**. . Nervous System :

Review of structure and function of neuron, conduction of nerve impulse, synapses, role of neurotransmitters.

Unit .**3.** Organization of central nervous system, Structure and function of Brain and spinal cord, afferent and efferent nerves, hypothalamus and its role in various body functions-obesity, sleep, memory.

Unit **4.** Sense Organs :

Review of structure and function, role of skin, eye, ear, nose, and tongue in perception of stimuli.

Unit **5.** Digestive System :

Review of structure and function , secretory, digestive, and Absorptive functions, role of liver, pancreas and gall bladder and their dysfunction.

MA Part I

SEMESTER II

Paper-VII Child and Maternal Nutrition

Code :HSC523

Credits: 4(4+0)

Full Marks: 70 ESE+30CIA

Contents

Unit **1**. Nutrition in the Pre-School Age:
Growth and development of Pre-school children, nutritional requirements of Pre-school Children, prevalence of malnutrition, food habits and supplementary foods for pre-school children

Unit **2**. .Nutrition during School Age (upto-12):

Nutrition requirements of school age children, special problems in feeding school children.

Unit **3**. Planning diet for childhood diseases : Gastro Liver disease, protein and calorie malnutrition.

Unit **4**. Malnutrition in Mothers and Children: effects of nutritional status of mother on children's health and diseases.

Unit **5**. Policy and programme for promoting maternal and child nutrition.

MA Part I

SEMESTER II

Paper-VIII Field and Laboratory Works

Code :HSC524

Credits: 6(0+6)

Full Marks: 50 ESE+50CIA

Contents

Unit **1**. A visit to a Milk Processing Unit and preparing a Report on it

Unit **2**. Structure of Eggs and Assessment of its quality.

Unit **3.** Isolation and Detection of Carbohydrates: Flour, Milk and Pulse.

Unit **4**. Study of Effects of Storage of any one food item on its Vitamin C component.

Unit **5**. Qualitative Test for Protein from selected Foods.

MA Part II

SEMESTER III

Paper-IX Food Science Code :HSC531

Credits: 5(5+0)

Full Marks: 70 ESE+30CIA

Contents

Unit **1**. Introduction to Food Science, Constituents of Food , their Properties and Significance.

Unit **2.** Polysaccharides, Sugars and Sweeteners:

Starch structure, gelatinization, methods for gelatinization changes, characteristics of some food starches, effects of ingredients and conditions on gelatinization modified food starches, sugar and sweeteners chemistry related to usages in food product, structural relationship to sweetness perceptions, hydrolytic reactions, solubility and crystallization, hygroscopicity colligative properties, textural contributions, fermentation, non-enzymatic growing.

Unit **3.** Fats, Oil and Related Products:

Source and composition, effects of composition on fat properties, functional properties of fat uses in food preparations.

Unit **4**. Proteins :

Classification, composition, denaturation, non-enzymatic browning and the chemical changes.

Unit **5**. Enzymes :

Nature of enzymes, stability and action, proteolytic.

MA Part II

SEMESTER III

Paper-X Therapeutic Nutrition

Code :HSC532

Credits: 5(5+0)

Full Marks: 70 ESE+30CIA

Content

Unit **1**. Introduction of Nutrition Therapy, effects of specific Nutrients on Physical Fitness

Unit **2.** Nutrition during Stress.

Unit **3**. Nutrition Management of Eating Disorders.

Unit **4**. Nutrition Management of Coronary Heart Diseases

Unit **5.** Nutrition Management of Metabolic Disease : Diabetes and Gout

MA Part II

SEMESTER III

Paper-XI Problems in Human Health and Nutrition

Code :HSC533

Credits: 4(4+0)

Full Marks: 70 ESE+30CIA

Contents

Unit **1**. Historical Background, Prevalence, Etiology Biochemical and Clinical Manifestations, and Therapeutic Measures for the following:

* PEM
* Vitamin A Deficiency
* Nutritional Anemia
* IDD

Rickets, Osteomalacia and Osteoporosis Fluorosis

Unit **2**. Historical background, Prevalence, Etiology Biochemical and Clinical Manifestations, and Therapeutic Measures for :-

* Obesity and Overweight
* Diabetes mellitus
* CHD

Unit **3**. Problems of Women in Health and Nutrition .

Unit **4**. Women's Nutritional requirements and Food Needs.

Unit **5**. Nutrition Education in Women Empowerment.

MA Part II

SEMESTER III

Paper-XII Field and Laboratory Practicals

Code :HSC534

Credits: 6(0+6)

Full Marks: 50 ESE+50CIA

Contents

Unit **1**. Planning and Preparation of Diets of Patients (any two)

(a) Diabetes Mellitus (b) Hepatitis
(c) Cardio vascular Disease (Hypertension) (d). Elderly in Health and Sickness

Unit **2.** Detection of Diabetes Mellitus

Unit **3**. Nutrition Evaluation using Anthropometric Techniques.

Unit **4**. Examination of the presence of Giardia

Unit **5**. Nutrition and Health Survey in the locality as suggested by the Department (report to be submitted)

MA Part II

SEMESTER IV

Paper-XIII Advanced Food Science

Code :HSC541

Credits: 5(5+0)

Full Marks: 70 ESE+30CIA

Contents

Unit **1**. Food Colorants and Food Flavours : Types and Properties of Food Colours , Regulatory Aspects, Natural and synthetic Flavours and their safety Issues.

Unit **2**. Milk and Milk Products:
Composition, physical and functional properties, Effects of Processing and Storage, Dairy Products : Yogurt, Butter, Whey, Cheese.

Unit **3**. Meat and Poultry:
Muscles Composition, Characteristics and Structure, post mortem changes, processing, preservation and their effects.

Unit **4.** Fish & Sea Food:
Types and composition, storage and changes during storage, changes during processing.

Unit **5.** Spices and Condiments:
Composition, flavouring Extracts-natural and Synthetic

MA Part II

SEMESTER IV

Paper-XIV Advanced Human Nutrition

Code : HSC542

Credits: 5(5+0)

Full Marks: 70 ESE+30CIA

Contents

Unit **1**. Energy: Energy Contents of Foods, Measurement of Energy Expenditure, BMR, RMR, Energy requirements of individuals, control food intake,digestion, abosorption and body weight.

Unit **2**. Carbohydrates : Types, Classification in source & functions digestion, absorption; Dietary Fibre, Sweeteners- Nutritive and Non-nutritive.

Unit **3**. Proteins : Classification, digestion, absorption, sources, function, protein quality, protein and amino acid requirements.

Unit **4**. Lipids : Classification, digestion, absorption, function of EFA, role of n-3, n-6 fatty acid in health and disease.

Unit **5.** Minerals: Micro Minerals, Macro Minerals and Trace Minerals,Source, bio-avaibility, functions, deficiency.

MA Part II

SEMESTER IV

Paper-XV Public Nutrition Code :HSC543

(Special Paper) Credits: 4(4+0)

Full Marks: 70 ESE+30CIA

Contents

Unit **1**. Concept of Public Nutrition: relationship between health and nutrition, role of public nutritionists in health care delivery.

Unit **2**. Nutrition Policy and Programmes.

Unit **3**. Primary Health care and Community: national health care delivery system, Determinants of Health Status, Indicators of Health.

Unit **4**. Food and Nutrition Security: food production, Access, Distribution, Availability, Losses, Consumption, Food Security, Socio-cultural aspects, Dietary Patterns and their implications for Nutrition and Health.

Unit **5.** Nutritional Status: Determinants of Nutritional Status of individual and Population- Nutritional and Non-nutritional Indicators such as, Socio-cultural, Biological, Environmental and Economic Indicators, Assessment of Nutritional Status in a Community Setting.

MA Part II

SEMESTER IV

Paper-XV Geriatric Nutrition

(Special Paper) Code: HSC543

Credits: 4(4+0)

Full Marks: 50 ESE+50CIA

Contents

Unit **1**. Theories of Ageing, the ageing process-physiological, biochemical and body composition changes.

Unit **2**. Demography and Socio-psychological aspects of ageing- special problems of elderly women.

Unit **3.** Nutritional requirements of the elderly and dietary management to meet nutritional needs.

Unit **4**. Chronic degenerative diseases- their management, prevention and control.

Unit **5**. Laws, policies and programmes of the government and other sectors pertaining to the elderly.

MA Part II

SEMESTER IV

Paper-XV Advances in Food Microbiology

(Special Paper) Code: HSC543

Credits: 4(4+0)

Full Marks: 50 ESE+50CIA

Contents

Unit **1**. Introduction to historical developments in food preservation, spoilage, infections and legislation.

Unit **2**. Factors affecting the growth of microorganisms in food- intrinsic and extrinsic parameters that affect microbial growth

Unit **3.** Spoilage of different groups of Foods: Cereal and Cereal Products, vegetables and fruits, meat and meat products, egg and poultry, fish and other sea foods, milk and milk products, canned foods.

Unit **4.** Food Preservation: Physical methods-Drying, freeze drying, cold storage, heat treatments, Irradiation, high pressure processing, Indicators of food safety and quality.

Unit **5**. Role of Microbes in fermented foods and genetically modified foods.

MA Part II

SEMESTER IV

Paper-XVI Laboratory Practical Works

Code :HSC544

Credits: 6(0+6)

Full Marks: 50 ESE+50CIA

Contents

Unit **1**. Estimation of Carbohydrate, Fibre, Moisture, detection of Cholesterol in any one food stuff.

Unit **2.** Estimation of Glucose in blood by Tritrimetric or Colorimetric Method.

Unit **3**. Estimation of Hemoglobin Content

Unit **4**. Detection of Urea in Urine, Urine Analysis for Sugar and Acetone

Unit **5**. Estimation of Fat contents in Milk