Govt. M.H. College of Home Science &
Science for Women (Autonomous)
Jabalpur M.P.

SYLLABUS: 2023-24

M.Sc. Ist & IInd Semester

(Home Science)

Department of
Food &Nutrition

M.Sc. (Home Science)Food and Nutrition Session 2023-24

Govt. M.H. College of Home Science & Science For Women, Jabalpur (M.P.)

Principal

Tel No. 0761-4005716,2407326

Fax No. 0761- 4005716

E-mail: principal@gmhcollege.nic.in

Letter No: UGCMH/ **Dated:**

CONSTITUTION OF BOARD OF STUDIES

Composition of Board of Studies : **Food & Nutrition**

1. Dean and Chairman : **Dr. Nandita Sarkar**
2. Head of the Department : **Dr. Smita Pathak**
3. Senior Faculty member of the Department : **Mrs. Vishwashanti Parashar**
4. Faculty members of the Department of Food & Nutrition:
   1. **Mrs. Apoorva Soni**
   2. **Mrs. Vibha Shripal**

4. Two subject experts from outside the Parent University to be nominated by the Academic Council

I. Dr. Renubala Sharma Govt. Girls P.G. College, Sagar

II. Dr. Meenal Phadnis Govt. MLB Girls P.G. College, Bhopal

6. One Expert to be nominated by the Vice Chancellor from panel of six recommended by the college principal.

I. Dr. Archana Mishra, Govt. M.L.B Girl's PG College, Bhopal

7. One representative from industry/ corporate sector/ allied area relating to placement.

I. Mr. Davinder Pal Singh Sodhi - Principal, SIHM, Jabalpur

8. One Postgraduate meritorious alumnus to be nominated by the principal.

I. Mrs. Anshika Dwivedi

9. The Chairman, Board of Studies, may with the approval of the principal of the college, co-opt:

I. **Smt. Sheela Pandey,** JNKVV, Jabalpur

a) Experts from outside the college whenever special course of studies are to be formulated.

I. **Dr. Alpana Singh-** JNKVV Jabalpur

(b) Other members of staff of the same faculty

I. **Dr. Abha Tiwari** - HOD Dept. of Human Development, Govt. M.H. College of Home Science & Science for Women, Jabalpur

Term: The term of the nominated members shall be of three years.

Meetings: The Board of studies shall meet at least twice a year.

PRINCIPAL
Govt. M.H. College of
Home Science &
Science, Jabalpur

M.Sc. (Home Science)Food and Nutrition **Session 2023-24**

Govt. M.H. College of Home Science & Science For Women, Jabalpur (M.P.)

Principal

Tel No. 0761-4005716,2407326
Fax No. 0761- 4005716
Email:principal@gmhcollege.nic.in

Letter No.UGC/MH/ Jabalpur, Dated:

CONSTITUTION OF BOARD OF STUDIES

The board of Studies of Food & Nutrition has been constituted as per the revised guideline of UGC (XII Plan). The term of the members shall be for two years.

Composition of Board of Studies : **Food & Nutrition**

1. Dean and Chairman : **Dr. Nandita Sarkar**
2. Head of the Department : **Dr. Smita Pathak**
3. Senior Faculty member of the Department : **Mrs. Vishwashanti Parashar**
4. Faculty members of the Department of Food & Nutrition: **1) Mrs. Apoorva Soni**
   2) Mrs. Vibha Shripal
5. Two subject experts from outside the Parent University to be nominated by the Academic Council
   I. **Dr. Renubala Sharma**- Govt. Girls P.G. College, Sagar
   II. **Dr. Meenal Phadnis**- Govt. MLB Girls P.G. College, Bhopal
6. One Expert to be nominated by the Vice Chancellor from panel of six recommended by the college principal- **Dr. Archana Mishra**, Govt. M.L.B Girl's PG College, Bhopal
7. One representative from industry/ corporate sector/ allied area relating to placement-
   Mr. Davinder Pal Singh Sodhi- Principal, State Institute of Hotel Management.
8. One Postgraduate meritorious alumnus to be nominated by the principal. The Chairman, Board of Studies, may with the approval of the principal of the college, co-opt-
   Mrs. Anshika Dwivedi

(a) Experts from outside the college whenever special course of studies are to be formulated-
   Dr. Alpana Singh- JNKVV Jabalpur

(b) Other members of staff of the same faculty-
   Dr Abha Tiwari - HOD Dept. of Human Development, Govt. M.H. College of Home Science & Science for Women, Jabalpur.

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Dr. Nidhi Choubey
In-Charge UGC(Meetings)

HOD

Dr. Nandita Sarkar
Principal

M.Sc. (Home Science)Food and Nutrition **Session 2023-24**

केन्द्रीय अध्ययन मण्डल द्वारा अनुसंशित स्नातकोत्तर पाठ्यक्रम सैद्धान्तिक विषय की परीक्षा योजना

कक्षा : M.Sc. (Home Science)

2023—24

विषय : FOOD AND NUTRITION

S.No	Semester	Paper	Title of the Paper	Max. Marks	Total
1.	I Semester	Theory	First –Applied Physiology	50	200
			Second - Advanced Nutritional Biochemistry	50	
			Third – Public Nutrition	50	
			Fourth- Research Method and Statistics	50	
		Practical	Practical I-Human Physiology & Advanced Nutritional Biochemistry.	50	100
			Practical II -Public Nutrition	50	
		Project	Project Paper Presentation/Assignment	50	50
2.	II Semester	Theory	First – Advances in Food Microbiology	50	200
			Second - Applied Biochemistry and Technique	50	
			Third- Nutrition and health Problems	50	
			Fourth- Statistics and computer application	50	
		Practical	Practical I - Food Microbiology and Applied Biochemistry Techniques.	50	100
			Practical II- Nutrition & Health Problems.	25	
			Practical III- Statistics and computer application	25	
		Project	Project Paper Presentation/Assignment	50	50

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M.Sc. (Home Science) Food and Nutrition Session 2023-24

3.	III Semester	Theory	First - Advanced Nutrition	50	200
			Second -Clinical and Therapeutic Nutrition	50	
			Third – Food Science & Current Trends	50	
			Fourth- Issues related to women health	50	
		Practical	Practical I Clinical and Therapeutic Nutrition	50	100
			Practical II Food Science & Current Trends	50	
		Project	Project –Paper presentation/assignment	50	50
4.	IV Semester	Theory	First- Health and fitness	50	200
			Second - Clinical and Therapeutic Nutrition	50	
			Third –Food Science & Current Trends	50	
		Optional	Fourth- Nutrition and Health of Child and Elderly OR Dissertation	50	
		Practical	Practical I –Clinical and Therapeutic Nutrition	50	100
			Practical II- Food Science & Current Trend	50	
		Internship	60 Hrs	100	100

Govt. M.H. College of Home Science &
Science for Women (Autonomous)
Jabalpur M.P.

SYLLABUS: 2023-24

M.Sc. I Semester

Department of
Food & Nutrition

Department of Higher Education, Govt. of M.P.

Semester wise syllabus for Postgraduates

As recommended by Central board of Studies and

Approved by HE the Governor of M.P.

M.Sc. (Home Science)
Food and Nutrition

Year 2023-24

SEMESTER-I
PAPER-I
Applied Physiology

M.M. 50(Th. 35 + CCE 15)

Objectives

This course will enable students

1. To understand the integrated functions of all systems in the science of physiology.
2. To understand the structure and functions in various organs and systems in relation to the diseased conditions.
3. To understand the advance issues to the relevant topics of Human physiology.

UNIT-I

1. **Cell and Tissues:** Structure and function of cell, structural organization of cell, organelle. **Tissues** - Formation of tissues, organ and system, elementary tissues in Human body.

2. **Musculoskeletal System:** Types of muscles (Skeletal, smooth, and cardiac muscles) their properties, characteristics, structure and functions. Fatigue, exercise mechanism of contraction Structural and function of Bone, cartilage and connective tissue. Disorders of skeletal muscle.

UNIT-II

1. **Blood:** Formation, Functions and composition of blood, Hematopoiesis, erythropoiesis, leucopoiesis, Formation and functions of plasma proteins. Factors influencing erythropoietin - RBC Indices - Blood groups, Blood clotting, Hemoglobin synthesis, Blood abnormalities.

2. **Immune system:** Natural immune system cell mediated and humoral immunity components of immune mechanism (cellular and chemical) Role of Inflammation/defense (acute and chronic). Activation of WBC and production of antibodies. Disorders - Immune deficiency, Hypersentivity.

3. **Reproductive System:** Male and female reproductive organ, menstrual cycle spermatogenesis.

UNIT-III

1. **Circulatory system:** Structure and functions of heart and blood vessels, cardiac output and blood pressure, cardiac cycle, Heart rate and heart sound, conditions affecting the heart rate, Heart failure, Hypertension, Mechanism of cardio vascular system.

2. **Respiratory system:** Structure and functions of respiratory tree, Mechanism of Breathing. Ventilation and its control. Exchange of gases and role of lungs in exchange of gases. Transport of O_2 and CO_2. Role of Hemoglobin and Buffer system, Cardio respiratory response to exercise.

UNIT-IV

1. **Digestive system:** Introduction of digestive system structure of digestive tract, functions of digestive system, Salivary glands and its secretion. Stomach and its secretions, pancreas, Bile, small Intestine, Large intestine, Digestive juices. Gastrointestinal Hormones.

2. **Excretory system:** Structure and function of kidney, nephron, Role of Kidney in maintaining pH of blood, Mechanism of urine formation, Mechanism of filtration, Electrolyte and acid-base balance. Renal function tests (Urine and blood), Diuretics.

UNIT-V

1. **Endocrine glands:** Structure function and classification according to chemical signals. Hormones, role of hormone, regulation of hormonal secretions and its control, Disorders of endocrine glands.

2. **Nervous system:** Structure and function of Brain, spinal cord, neuron. Reflex and its classification; nerve impulse - Afferent and efferent nerves. Hypothalamus and its role in various body functions – Obesity, sleep and memory.

3. **Sense organs:** Structure and functions: General Senses and special senses, Receptors of sensory nerves and perception of stimuli.

References

1. Ganong, W.F. (1985): Review of Medical Physiology, 12th Edition, Lange Medical Publication

2. Moran Campell E.J., Dickinson, C.J., Slater, J.D., Edwards, C.R.W. and Sikora, K. (1984): Clinical Physiciology, 5th Edition, ELBS, Blackwell Scientific Publications.

3. Guyton, A.C. (1985): Function of the Human Body, 4th Edition, B. Sanders Company, Philadelphia.

4. Guyton, A.C. and Hall, J.B. (1996): Text Book of Medical Physiology, 9th Edition, W.B. Sanders Company, Prisrr 3ooks (Pvt.) Ltd. Bangalore.

5. Wilson, K.J.W. and Waugh, A. (1996): Ross and Wilson Anatomy and Physiology in Health and illness, 8th Edition, Churchill Livingstone.

6. McArdle, W.D., Katch, F.I. and Katch, V.L. (1996): Exercise Physiology, Energy, Nutrition and Human Performance, 4th Edition, Williams and Wilkins Baltimore.

7. Jain, A.K. Textbook of Physiology, Vol I and II. Avichal Publishing Co. New Delhi 8. Text book of physiology Vol I & II

Sheela Pandey Alpana Dwivedi

Department of Higher Education, Govt. of M.P.
Semester wise syllabus for Postgraduates
As recommended by Central board of Studies and
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2023-24

M. Sc. (Home Science)

Food and Nutrition

SEMESTER-I

PAPER-II

Advanced Nutritional Biochemistry

M.M. 50(Th. 35+ CCE 15)

Objectives:

- Augment this Biochemistry knowledge acquired at the undergraduate level.
- Understand the mechanism adopted by the human body for regulation of metabolic pathways.
- Get an insight into interrelationship between various metabolic pathways.
- Become proficient for specialization in nutrition.
- Understand integration of cellular level metabolic events to nutrition disorder and imbalances.

UNIT-I

Plasma proteins, nature, properties and functions. Purines, and pyrimidines: synthesis and breakdown.

UNIT-II

Intermediary metabolism - an overview and its regulation. Equilibrium and Non-equilibrium reactions, committed steps, allosteric modification, covalent modulation, hormonal induction and repression, cross over theorem, starve feed cycle, calorie homeostasis and futile cycle.

UNIT-III

1. **Carbohydrates:** glycolysis, glycogenesis, citric acid cycle, haxose monophosphate pathway and gluconeogenesis.
2. **Lipids:** Beta-oxidation, de novo synthesis of fatty acids. Synthesis and breakdown of unsaturated fatty acids. Cholesterol, phospholipids and triacylglycerol –Significance, Biomedical importance of cholesterol. Action of different phospholipases on phospholipids.

UNIT-IV

Major alterations in protein, carbohydrates and fat metabolism and chronic nutritional related degenerative diseases e.g. diabetes and hypertension.

Nucleic acids: DNA replication and transcription. DNA repair system, DNA recombination, genetic mutation, regulation of gene expression and protein biosynthesis. Effect of antibodies on protein synthesis.

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M.Sc. (Home Science)Food and Nutrition **Session 2023-24**

UNIT-V

Hormones: Mechanism of action of hormones.
Negative feedback, hormone receptor, intracellular messengers. Mechanism of action of protein and steroid hormones.

Conversion of amino acids to specialized products, VIZ. Creatine, Histamine, serotonin catecholamines and melanin.

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M.Sc. (Home Science)Food and Nutrition **Session 2023-24**

Human Physiology & Advanced Nutritional Biochemistry

Practical- M.Sc (Home Science)

Food & Nutrition

SEMESTER -I PAPER-I & II

Human Physiology -I **M.M. 50**

Practical Section -A

1. Preparation and staining of blood film.
2. Identification of different component at blood in a blood film.
3. Estimation of blood count: WBC count, RBC count
4. Hemoglobin estimation
5. Recording of blood pressure.
6. Vital capacity and different components of vital capacity
7. Urine estimation (Renal function Test)

Section - B *(Any one)*

1. **Protein:**
   - Estimation of proteins in foodstuff.
   - Estimation of albumin, globulin and A : G ratio in serum and urine
   - Estimation of glucose in blood and urine

2. **Glucose** Estimation of glucose in blood and urine.
3. **Lipid** Estimation of lipid in food by soxhlet extraction method.
4. **Calcium** Estimation of calcium in food and serum
5. **Phosphorus** Estimation of inorganic- phosphorus in food and serum.
6. **Buffer** Preparation of phosphate, carbonate and acetate buffer and determination of their pH values.
7. **Survey** Survey of pathological laboratories to obtain information about different methods uses in blood serum analysis.

M.Sc. (Home Science)Food and Nutrition Session 2023-24

Department of Higher Education, Govt. of M.P.

Semester wise syllabus for Postgraduates

As recommended by Central board of Studies and Approved by HE the Governor of M.P.

2023-24

M.Sc. (Home Science)
Food and Nutrition

SEMESTER-I

PAPER-III- Public Nutrition

Objectives **M.M.: 50(Th. 35+ CCE 15)**

1. Develop a holistic knowledge base and understanding of public nutrition concept..
2. Understand the health economic, food situations and determinations of nutritional status.
3. Be familiar with various approaches to nutrition and health interventions, programmes and policies.

UNIT-I

1. Concept of Public Nutrition
2. Definition and concepts of health. Determinants of Health
3. Relationship with health and nutrition.
4. Role of public nutritionists in the health care delivery.
5. Population dynamics: Demographic transition population structures fertility behavior. Nutrition and quality of life.

UNIT-II

1. **Food and Nutrition security**
   Food production. Access, Distribution, Losses and consumption

2. **Nutritional Status**

A) Determinants of nutritional status

B) 1. Nutrition Indicators - Functional indicators such as grip strength respiratory fitness Harvard step test, squatting test

2. Non- nutritional indicators of nutritional status (Sociocultural, biological, environmental and economic)

C) Monitoring & Evaluation

3. **Health Economics and Economics of Malnutrition.** Its impact on productivity and national development

UNIT-III

1. **National Food and Nutrition Policy, Plan of Action**

A) Sectors and public relevant to nutrition –

- National and International organization of nutrition.
- Specific community nutrition programmes in India.
- Case studies of selected strategies and programmes.

UNIT-IV

1. **Approaches and strategies for improving nutritional status.**
   a) Programmable Option: Health and nutrition based interventions, supplementary feeding, fortification and genetic improvement of foods.
   b) Merits and demerits of these options.
   c) Factors in feasibility of these programmes i.e. political support. Available resource (human infrastructural, financial)
2. **Programme Planning, implementation, operation, monitoring surveillance and evaluation.**
3. **Nutrition Education**
   a) Definition, purpose, importance
   b) Methods and tools
   c) Channels of nutrition education
   d) Evaluation of nutrition education

UNIT-V

1. **Public Health Administration**

(a) Central and state health organizations

(b) Primary Health Care in India
   (i) Elements of Primary Health Care
   (ii) Principles of Primary Health Care
   (iii) Primary-Health Care of village level sub centre level and primary health centre level, community health centers.

(c) Health Care Systems.

References

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2. Paris KL (2000) Park's Textbook of Preventive and Social Medicine, 18th Edition M/s Banarasidas Bhanat, Jabalpur.
3. SCN News; UNACC/SCN Subcommittee on Nutrition.
4. State of the World's Children. UNICEF
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14. National Nutrition Policy (1993) WCD, Govt. of India.
15. Nutrition Education for the Public (1940: FAO Food and Nutrition Pager 62 FAO

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21. Fortification To End Micronutrient Malnutrition. The Micronutrient Initiative Outwa Ganada. Micronutrient initiative, Ottawa Canada.
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29. Waterlow, I.C. (1992) Protiea Energy Malnutrition, Arnold, A Division Of Hodde & Stoughton.
30. Bauemfeind J Christopher (Ed) Vitamin A. Deficiency and its control Acade Press.
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32. Rajiv Gandhi Drinking Water Mission Prevention and Control of Fluorosis Ministry of Rural Development.
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34. Gopalan C (RD) (1993) Recent Trends in Nutrition, oxtod I'niversity Press.
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M.Sc. (Home Science)
Food and Nutrition

PRACTICAL-II
Public Nutrition
Semester: I

M.M. 50

1. Collect data and compare the rural and urban communities through analysis for:
   (a) Determinants of malnutrition.
   (b) Socio-economic groups
   (c) Types of nutritional problems in different segments and age groups

2. Development of methods and tools of nutritional education

3. Plan, prepare and calculate one dish meal specific to your own region for
   (a) Pregnant woman
   (b) Lactating mother

4. Prepare and administer a food frequency questionnaire on a 4-year old child to assess his intake of energy, proteins, iron and vitamin A rich food.

5. Dietary Assessment
   (a) Conduct a 3-days 24-hours recall on an adolescent girl and comment on her nutritional status.
   (b) Evaluate her dietary assessment after a month for feedback

6. Case study of existing intervention programme in voluntary and government sector.

7. Development of a plan for nutrition intervention project in the community.

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Department of Higher Education Govt of M.P.
Semester Wise Syllabus for Undergraduates
As Recommended by Central Board of Studies and
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2023-24

FOOD & NUTRITION

M.Sc. – HOME SCIENCE

SEMESTER - I

PAPER -IV

RESEARCH METHODS AND STATISTICS

M.M: 50(Th. 35+ CCE 15)

OBJECTIVES :

- To understand the role of Statistics and Computer Application in Research.
- To apply statistical techniques to research data for analyzing and interpretation of data.
- To understand the significance of statistics and research methodology in Home Science research.
- To understand the types tools, methods of research and develop the ability to construct data gathering instrument appropriate to the research design.
- To understand and apply the appropriate statistical technique for the measurement and design.

CONTENTS :

UNIT - I

- Research: Meaning, objectives and significance of research.
- Science, scientific methods, scientific approach.
- Role of statistics and research in Home Science discipline.
- Types of Research: Historical, descriptive, experimental, social research (In brief).

UNIT-II

Sampling methods -

- Meaning of Population and sample- Meaning and characteristics of a sample.
- Aims of sampling
- Essentials of a good sample
- Types of a good sampling
- (A) Probability & semi probability sampling - simple random, systematic random sampling, two stages and

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multi stage sampling, cluster sampling.

- (B) Non-Probability sampling: purposive, quota and volunteer sampling.
- Merits & Demerits of Sampling.

UNIT-III

- Definition and identification of a Research problem. Origin and sources of research problem.
- Selection, justification & limitation of research problem.
- Classification- Meaning, definition and objectives, Methods of Classification, Advantages and limitations.

UNIT - IV

- Tabulation of data- Objectives, advantages and limitation of tabulation, quality of a good table, rule for tabulation, Types of table
- Graphic presentation, frequency distribution, histogram, polygons, ogive, pictogram
- Average of position in individual, discrete and continuous series. Characteristic of a good average , Meaning definition, uses and limitations on Mean, Median and mode

UNIT - V

- Hypothesis – meaning, nature, characteristics, types & functions of hypothesis. Criteria of a good research hypothesis.
- Testing of hypothesis .Type I and type II errors.
- Non Parametric Methods- Chi Square Test, Condition for Chi Square test and Yates Correction.

Note: With the view to benefit of the students of MSc. Semester I, II (CT, FN, HD, RM) paper IV research methods and statistics paper IV and computer application.

1. The inter change of the statistical and theoretical part of the paper has been intermingle to stabilize the difficulty level of the paper without deleting any part/ portion of the already exiting repetitions.

Reference:

- Garrett, Henery E. (1971) Statistics in Psychology and education, David Heley and Co.
- Banderker, PI and Wilkinson TS 2000 Methodology and Techniques of Social Research, Himalaya Publication House Mumbai
- Bhatnagar GI 1990: Research methods and measurements in behavioral and social science, Agric cole publishing academy, New Delhi

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Govt. M.H. College of Home Science &
Science for Women (Autonomous)
Jabalpur M.P.

SYLLABUS: 2023-24

M.Sc. II Semester

Department of
Food & Nutrition

M.Sc. (Home Science)Food and Nutrition Session 2023-24

As recommended by Central board of Studies and
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2023-24

M.Sc. (Home Science)

Food and Nutrition

SEMESTER-II
PAPER-I
Advancesin Food Microbiology

Objectives **M.M. 50(Th. 35+CCE15)**

1. The course will enable the students to gain deeper knowledge of micro organism in human environment and to understand the importance of Microorganism in foods technology.
2. To understand legal aspects in the areas.
3. To develop skills in handling food safety.
4. To know the food borne diseases and how to prevent it.

UNIT-I

Introduction to Food Microbiology:

1. Historical development of Microbiology and Food Technology Regulations and Standards in food legislation.

2. **Environmental Microbiology:** Bacteria Mold, fungi, yeast and virus their morphology, cultural characteristics biochemical activities, their sources in foods.

3. **Factors affecting growth of micro organism in Foods** Intrinsic and extrinsic parameter. Conditions that influence microbial growth in food.

UNIT-II

Estimation and Isolation of Micro Organisms:

1. Historical development of Microbiology and Food Technology Regulations and Standards in food legislation.
   - Conventional methods; SPC
   - Immunological Methods: RIA, ELISA, FIA
   - Chemical Method: ATP measurement and PCR (Polymerase-Chain Reaction)
   - Rapid methods (new techniques)

2. Microscope colony count, Analysis, DMC (Direct Micro Scopic Count).

3. Estimation of the number 'O' Microorganisms, MPN (Most Probable Numbers)

UNIT-III

Microbiology of different foods:

1. Major cause of food spoilage, principles of food preservation control of micro organisms: by destruction and by retarding growth. Microbial Intoxication in food groups such as- Milk & Milk products, cereals, Meat, fish, egg, fruits & vegetables canned foods.

2. Food Borne diseases: (Bacterial and Viral) Signs/Symptoms and prevention
   - Staphylococcal Gastro enteritis
   - Clostridium perfinger
   - Botulinum and Vibrio
   - E-Coli, Salmonella, Shigellae
   - Poliomyelitis
   - Infectious Hepatitis.

UNIT-IV

Microbiology safety of foods:

1. Indicators of food safety and quality, Indicator organisms: methods for detection. Microbiological criteria of various foods products and their significance definition sampling plan.
2. HACCP System, Food safety used in controlling Microbiological Hazards
3. Antimicrobial compounds: Biologically based preservation system, probiotic Bacteria.

UNIT-V

Role of Microbes:

Its advantages and disadvantages in food production. Use of Microorganism in Dairy Products, Meat, Fish, Beverage, Bread and Idli: Beer, Wine, Yoghurt etc
Apparent health benefits of fermented foods and the role of microbes.

GMF (Genetically Modified Foods)
Definition, use advantages and Characteristics of GMF. GM applications,Food future by genetically modified organisms.

References:

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8. Adams, M.R. and M.G. Moss (1995): Food Microbiology, 1st Edition, New Age International (P) Ltd.

9. Bensaon, H.J. (1990) Microbiological applications, C Brow

10. Roday, S. (1999) Food Hygiene and sanitation, 1st Edition. Tata McGraw Hill, New Delhi.

11. Venderzant, C. and D.F. splits Toesser (192): Compendium of Methods for the Microbiological Examination of Foods, 3rd Edition, American Public Health Association, Washington DC.

Journals

12. Journal of Food Science Published by the Institute of Food Technologists, Chicago lu. USA.

13. Journal of Food Science and Technology Published by Association of Food Scientists and Technology (India) CFTRI Mysore

14. Food Technology published by the Institute of Food Technologists, Chicago lu. USA.

M.Sc. (Home Science)Food and Nutrition Session 2023-24

Department of Higher Education, Govt. of M.P.

Semester wise syllabus for Postgraduates

As recommended by Central board of Studies and Approved by HE the Governor of M.P.

SEMESTER-II

PAPER-II

Applied Biochemistry and Techniques

M.M. 50 (Th. 35+CCE 15)

Objectives

This course will enable students to:

1. Augment this Biochemistry knowledge acquired at the undergraduate level.
2. Understand the mechanisms adopted by the human body for regulation of metabolic pathways.
2. Get an insight into interrelationship between various metabolic pathways.
3. Become proficient for specialization in nutrition.
4. Understand integration of cellular level metabolic events to nutrition disorder and imbalances.
5. Understand the principles of various analytical methods for nutrition research.
6. Familiarize with the application of the above techniques.

UNIT-I

Vitamins and trace elements in the function of enzymes

Vitamin & hydrolysis, Thiamine & dehydrogenises, Riboflavin & dehydrogenises, pyridoxine, Pantothenic acid, Biotin, Folic Acid & cobamide.

Detoxification in body metabolism of forcign compounds

Detoxification of cyanides and drugs.

UNIT-II

- Membrane structure assembly and function.
- Hemoglobin and its metabolism.

UNIT-III

Basic of instrumentation, physico-chemical principles and methodology, colorimetry, photometry-flourimetry, flame photometry and atomic absorptionmetry

UNIT-IV

- **Electrophoresis** - principles and applications in paper and gel electrophoresis.
- **Chromatography** principles and applications in paper (circular, ascending and descending) ion exchange column, thin layer, gas liquid and high performance **Chromatographic techniques.**

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- **Isotopes** and their use radio active and stable isotopes.Radiotherapy,nuclear and modern uses of radio-isotopes.
- **Immunological method** RIA and ELISA.

UNIT-V

- Bioenergetics and metabolism, a survey of metabolism, anabolic catabolic
- Pathways- their differences, role of ATP cycle in bioenergetics.
- Biological oxidation, respiratory chain, oxidative phosphorylation –ETC& formation with chemical osmotic core.
- Project- Project report to be submitted by the students guided by the teachers based on the course content of the paper.

M. Sc. (Home Science)
Food and Nutrition

SEMESTER-II

PRACTICAL-I

Food Microbiology and Applied Biochemistry & Techniques

***Total Marks:*50 *Sessional:*10 *Viva:*10 *Pract. Exam:*30 (15Section A) (15 Section B)**

Section-A *(Any five)*

1. Preparation of common laboratory media and special media for cultivation of bacteria yeast and molds.
2. Staining of Bacteria: Gram's staining acid fast, spore, capsule and flagellar, staining, motility of bacteria.
3. Staining of yeast and molds.
4. Cultivation and identification of important molds and yeast (slides and mold culture)
5. Study of environment around us sources of transmission of Micro-organism in foods: Assessment of surface sanitation of food preparation units, swab and rinse techniques.
6. Bacteriological analysis of foods: Both processed and unprocessed vegetables and fruits, cereal, spices and canned food, using conventional methods, yeast and mold count in foods.
7. Demonstration of available rapid methods and diagnostic kits used in identification of micro-organism or their products.
8. Visits (at least two) to food processing units or any other organization dealing with and advanced method in food microbiology.

Section-B (Any five)

1. Ascorbic acid: Estimation of ascorbic acid in foods.
2. Cholesterol: Estimation of cholesterol in serum.
3. Enzyme assay: Estimation of activity of serum. Alkaline phosphates and transaminase.
4. Urea and creatinine: Estimation of urea and creatinine in serum and urine.
5. Acids and alkalis: Preparation of dilute solutions of common acids and alkalis and determining their normalities.
6. Spectrometry: Beer Lambert's Law, absorption maximum, preparation of standard curve. Nutrient estimation in UV and visible range.
7. Chromatography: Paper, ion exchange and column chromatography.
8. Electrophoresis: Fractionation of plasma protein.

Department of Higher Education, Govt. of M.P.

Semester wise syllabus for Postgraduates

As recommended by Central board of Studies and
Approved by HE the Governor of M.P.

2023-24

M.Sc. (Home Science)

Food and Nutrition

SEMESTER-II
PAPER-III
Nutrition and Health Problems

M.M. 50(Th. 35+CCE15)

Objectives

The course will enable students to:

1. Understand the nature of important nutrition problems and their prevention and control.
2. Study and understand the Epidemiology of communicable diseases and nutrition related problems prevalent among the affluent and the less privileged groups
3. Study the biochemical and clinical manifestations preventive and therapeutic measures of common nutrition and health problems.

UNIT-I

Epidemiology

- Definition, aims and approaches
- Measurements and its roles
- Method in Epidemiology in brief
- Uses of epidemiology
- Epidemiology of communicable diseases
- Dengue, Plague, cholera, mumps, tetanus, rabies, tuberculosis etc.

UNIT-II

- Dynamics of disease transmission
- Sources Modes and susceptible host.
- Disease prevention and control early diagnosis, notification, investigation, isolation, quarantine, treatment and disinfections.
- Host defenses: Active and Passive Immunity.
- Immunization programme in India.

UNIT-III

- Nutritional problems of the community.
- Problems of vulnerable groups
- National and Global nutritional problems prevention and control of Famine Disaster, War, Relief feeding Emergency feeding etc.
- Basic concepts & facts about HIV/AIDS
  (a) Transmission of HIV infection, signs & symptoms of AIDS
  (b) Diagnosis of HIV infection.
  (c) Management & care of HIV infected persons.
  (d) Content of communication about HIV/AIDS
  (e) Prevention of HIV infection

UNIT-IV

Historical background, prevalence, etiology, biochemical and clinical manifestation, preventive and therapeutic measures for the following

- Protein Energy Malnutrition
- Vitamin A deficiency
- Nutritional Anaemia
- Iodine deficiency disorders
- Rickets, osteomalacia and osteoporosis
- Fluorosis

UNIT-V

Historical Background, prevalence, etiology, biochemical and clinical manifestation, preventive and therapeutic measures for the following

- Obesity and Overweight
- Diabetes mellitus
- Coronary Heart disease
- Cancer
- SARS
- Other nutritional problems
- Lathyrism, dropsy, aflatoxicosis, alcoholism.

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M.Sc. (Home Science)
Food and Nutrition

SEMESTER-II
Nutrition and Health Problems

Practical- **M.M. 25**

1. Development of low cost recipes suitable for various vulnerable groups.

2. Survey the local schools and plan 6 days cyclic menu for nutritious snacks/lunch for preschool children.

3. Plan a project for the prevention of any disease condition. (Deficiency or some other)

4. Study of various deficiency diseases: Prevalence and etiology on the basis of analysis of primary and secondary data.

5. Visit to any operational public nutrition programme for field experience and writing a report.

6. One day activity in your college: To develop a questionnaire based on nutritional knowledge. Assess it on college going girls and provide nutritional counseling to them.

7. Develop a suitable teaching aid to increase awareness regarding AIDS, Drug abuses and anemia among college going girls through lectures. Posters, charts, etc.

8. Preparation of diet counseling aids for obesity, Diabetes and kidney disease.

Department of Higher Education Govt. of M.P.
Semester Wise Syllabus for Undergraduates
As Recommended by Central Board of Studies and
Approved by HE the Governor of M.P.
2023-24

M.Sc. - **Food and Nutrition**

SEMESTER- II

PAPER – IV

STATISTICS & COMPUTER APPLICATION

M.M. 50(Th. 35+ CCE15)

OBJECTIVES

- To understand the role of statistics and computer applications in research
- To apply statistical techniques to research data for analyzing and interpreting data.
- To understand the significance of statistics and research methodology in Home science research.
- To understand the types, tool, and methods of research and develop the ability to construct data gathering instruments appropriate the research design.
- To understand and apply the appropriate statistical technique for measurement and testing.

Note : Special instructions should be send to paper setter to set one theoretical question and its option should numerical question.

UNIT - I

- **Normal Distribution-** Meaning, definition, characteristics and uses, deviation from normality.
- **Measures of Variability-** Range quartile deviation, mean deviation, standard deviation or SD, merits and limitations

UNIT-II

Quantitative research method

- Definition, theory, characteristics , design (steps involved in the process), types, merits and limitations, reliability & validity of
  1. Socio metric scale
  2. Questionnaire
  3. Schedule.

- Correlation –Meaning and Types,
- Correlation- Meaning and Types.
- Coefficient of correlation by scatter diagram, rank correlation, product movement method.

UNIT-III

- Qualitative research Method

1. Definition Theory characteristics, design, steps involved in the process types merits and limitations, reliability & validity of :-
    a. Case study
    b. Interview
    c. Observation
2. Application of student "t' test for small samples, Difference in proportion for means and difference in mean- Critical ratio

UNIT- IV

Research Design

- Meaning, features concept & purpose of research design.
- Latin square design — Main Characteristics, merits of Latin square design
- Factorial design- Definition merits of factorial design with two independent variable 2x2, 2x3.
- Writing a research report – Purpose, content of a report, characteristics of a good report.

UNIT – V

- Variables: Meaning, Nature, Types and selection of variables
- Experimental Designs - Nature, types - Single group , Two group , Control & Experimental Group.
- Randomized block design
- Analysis of Variance- Nature, Use and basic concept. One and two way F- Ratio.

PRACTICAL **TOTAL MARKS: 25**

STATISTICS & COMPUTER APPLICATION

1. Tabulation, Classification
2. Graphic Presentation, Frequency curve, Histogram, Frequency, Polygons, Ogive.
3. Calculation of Mean, Median, Mode.
4. Calculation of Standard Deviation.
5. Correlation.

Note: Students should be given hands-on experience to use appropriate software packages for selected statistical analyses.

Reference:

- Garrett, Henery E. (1971) Statistics in Psychology and education, David Heley and Co.
- Edwards : Experimental Design in Psychological research
- Kerlinger: Foundation of Educational Research.
- SPSS/PC for the IBM PC/Xt. SPSS Inc.
- Goyal Mathamatics statistics.
- **Levin** Statistics for Management.
- Yule An Introductory to the theory of statistics.
- Moud Introduction to the theory of statistics,
- Freund Mathematical statistics.
- Nag Mathematical statistics.
- Patri Statistical Methods.
- Choundan Statistics for Business and Economics
- Singh Principal of Statistics.
- Thamligom research methodology,
- Kothari research methodology.
- Agrawal Basic Statistics.
- Sankhyaki ke mule sidhant (Hind) Or. H.K. Kapil.

Sankhakiya vidhiya vayvhar park vigyano mai by Dr. S.P Gupta.

Fundamental of research Keriliger

- Anusandhan Vidhiya By Parasnath.

Govt. M.H. College of Home Science &
Science for Women (Autonomous)
Jabalpur M.P.

SYLLABUS: 2023-24

M.Sc. IIIrd & IVth Semester

(Home Science)

Department of
Food &Nutrition

M.Sc. (Home Science)Food and Nutrition **Session 2023-24**

Govt. M.H. College of Home Science & Science For Women, Jabalpur (M.P.)

Principal

Tel No. 0761-4005716,2407326
Fax No. 0761- 4005716
Email:principal@gmhcollege.nic.in

Letter No.UGC/MH/ **Jabalpur, Dated:**

CONSTITUTION OF BOARD OF STUDIES

The board of Studies of Food & Nutrition has been constituted as per the revised guideline of UGC (XII Plan). The term of the members shall be for two years.

Composition of Board of Studies : **Food & Nutrition**

1. Dean and Chairman : **Dr. Nandita Sarkar**
2. Head of the Department : **Dr. Smita Pathak**
3. Senior Faculty member of the Department : **Mrs. Vishwashanti Parashar**
4. Faculty members of the Department of Food & Nutrition: **1) Mrs. Apoorva Soni**
   2) Mrs. Vibha Shripal
5. Two subject experts from outside the Parent University to be nominated by the Academic Council
   I. **Dr. Renubala Sharma**- Govt. Girls P.G. College, Sagar
   II. **Dr. Meenal Phadnis**- Govt. MLB Girls P.G. College, Bhopal
6. One Expert to be nominated by the Vice Chancellor from panel of six recommended by the college principal- **Dr. Archana Mishra,** Govt. M.L.B Girl's PG College, Bhopal
7. One representative from industry/ corporate sector/ allied area relating to placement.
   Mr. Davinder Pal Singh Sodhi- Principal, State Institute of Hotel Management.
8. One Postgraduate meritorious alumnus to be nominated by the principal. The Chairman, Board of Studies, may with the approval of the principal of the college, co-opt-
   Mrs. Anshika Dwivedi

(a) Experts from outside the college whenever special course of studies are to be formulated-
   Dr. Alpana Singh- JNKVV Jabalpur

(b) Other members of staff of the same faculty-
   Dr Abha Tiwari - HOD Dept. of Human Development, Govt. M.H. College of Home Science & Science for Women, Jabalpur.

Academic Council
Approved

Dr. Nidhi Choubey
In-Charge UGC(Meetings)

HOD

Dr. Nandita Sarkar
Principal

M.Sc. (Home Science)Food and Nutrition Session 2023-24

Govt. M.H. College of Home Science & Science For Women, Jabalpur (M.P.)

Principal

Tel No. 0761-4005716,2407326

Fax No. 0761- 4005716

E-mail: principal@gmhcollege.nic.in

Letter No: **UGCMH/** **Dated:**

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Composition of Board of Studies : **Food & Nutrition**

1. Dean and Chairman : **Dr. Nandita Sarkar**
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4. Faculty members of the Department of Food & Nutrition:
   1. **Mrs. Apoorva Soni**
   2. **Mrs. Vibha Shripal**

4. Two subject experts from outside the Parent University to be nominated by the Academic Council

   I. **Dr. Renubala Sharma** Govt. Girls P.G. College, Sagar

   II. **Dr. Meenal Phadnis** Govt. MLB Girls P.G. College, Bhopal

6. One Expert to be nominated by the Vice Chancellor from panel of six recommended by the college principal.

   I. **Dr. Archana Mishra,** Govt. M.L.B Girl's PG College, Bhopal

7. One representative from industry/ corporate sector/ allied area relating to placement.

   I. **Mr. Davinder Pal Singh Sodhi** - Principal, SIHM, Jabalpur

8. One Postgraduate meritorious alumnus to be nominated by the principal.

   I. **Mrs. Anshika Dwivedi**

9. The Chairman, Board of Studies, may with the approval of the principal of the college, co-opt:

I. **Smt. Sheela Pandey**, JNKVV, Jabalpur

a) Experts from outside the college whenever special course of studies are to be formulated.

I. **Dr. Alpana Singh**- JNKVV Jabalpur

(b) Other members of staff of the same faculty

I. **Dr. Abha Tiwari** - HOD Dept. of Human Development, Govt. M.H. College of Home Science & Science for Women, Jabalpur

Term: The term of the nominated members shall be of three years.

Meetings: The Board of studies shall meet at least twice a year.

PRINCIPAL
Govt. M.H. College of
Home Science &
Science, Jabalpur

Academic Council
Approved

M.Sc. (Home Science)Food and Nutrition **Session 2023-24**

केन्द्रीय अध्ययन मण्डल द्वारा अनुशंशित स्नातकोत्तर पाठ्यक्रम सैद्धान्तिक विषय की परीक्षा योजना

कक्षा : M.Sc. (Home Science)

2023 -24

विषय : FOOD AND NUTRITION

S.No	Semester	Paper	Title of the Paper	Max. Marks	Total
1.	I Semester	Theory	First –Applied Physiology	50	200
			Second - Advanced Nutritional Biochemistry	50	
			Third – Public Nutrition	50	
			Fourth- Research Method and Statistics	50	
		Practical	Practical I-Human Physiology & Advanced Nutritional Biochemistry.	50	100
			Practical II -Public Nutrition	50	
		Project	Project Paper Presentation/Assignment	50	50
2.	II Semester	Theory	First – Advances in Food Microbiology	50	200
			Second - Applied Biochemistry and Technique	50	
			Third- Nutrition and health Problems	50	
			Fourth- Statistics and computer application	50	
		Practical	Practical I - Food Microbiology and Applied Biochemistry Techniques.	50	100
			Practical II- Nutrition & Health Problems.	25	
			Practical III- Statistics and computer application	25	
		Project	Project Paper Presentation/Assignment	50	50

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M.Sc. (Home Science)Food and Nutrition Session 2023-24

3.	III Semester	Theory	**First** - Advanced Nutrition	50	200
			Second -Clinical and Therapeutic Nutrition	50	
			Third – Food Science & Current Trends	50	
			Fourth- Issues related to women health	50	
		Practical	**Practical** I Clinical and Therapeutic Nutrition	50	100
			Practical II Food Science & Current Trends	50	
		Project	**Project –Paper presentation/assignment**	50	50
4.	IV Semester	Theory	**First**- Health and fitness	50	
			Second - Clinical and Therapeutic Nutrition	50	200
			Third –Food Science & Current Trends	50	
		Optional	**Fourth**- Nutrition and Health of Child and Elderly **OR** Dissertation	50	
		Practical	Practical I –Clinical and Therapeutic Nutrition	50	100
			Practical II- Food Science & Current Trend	50	
		Internship	60 Hrs	100	100

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Govt. M.H. College of Home Science &
Science for Women (Autonomous)
Jabalpur M.P.

SYLLABUS: 2023-24

M.Sc. III Semester

Department of
Food & Nutrition

Department of Higher Education, Govt. of M.P.
Semester wise syllabus for Postgraduates

As recommended by Central board of Studies and Approved by HE the Governor of M.P.

2023-24

M.Sc. (Home Science)
Food and Nutrition

SEMESTER-III
PAPER-I
Advanced Nutrition

M.M. 50 (Th. 35+ CCE 15)

Objectives

The course is designed to:

- Provide in depth knowledge of the physiological and metabolic role of various nutrients and their interactions in human nutrition.
- Enable students to understand the basis of human nutritional requirements and recommendations through the life cycle.
- Familiarize students with the recent advances in nutrition.

UNIT-I

Energy: Energy content of food. Physiological fuel value-review. Measurement of energy expenditure, BMR, thermic effect of feeding and physical activity. Methods of measurement. Estimating energy requirement of individual and groups.

Regulation of energy metabolism: control of food intake, digestion, absorption and body weight.

UNIT-II

Carbohydrates: Digestion and transport review-dietary fiber, fructooligosaccharides, resistant starch-chemical composition and physiological effects, Glycemic index of foods.
Sweeteners-nutritive and non-nutritive.

UNIT-III

(a) **Protein:** Digestion, absorption transport- review
(b) Protein quality, methods of evaluation protein needs.
(c) Therapeutic application of specific amino acids: Branched chain amino acids and others.

Academic Council Approved

UNIT-IV

Lipids: Digestion, absorption transport review.
Functions of essential fatty acids. Role of n-3, n-6 fatty acids. Prostaglandins. Fat requirements.

UNIT-V

Water: Regulation of intra and extra cellular volume osmolarity, water balance and its regulation.

References:

1. Annual Reviews of Nutrition. Annual Review Inc. California, USA.
2. Shils, M.E.; Osson, J.; Shike, M. and Roos, C. (1998) Modern Nutrition in Health and Disease 9th edition. Williams and Williams, A. Beverly Co. London.
3. Bodwell, C.E. and Erdman, J. W. (1998) Nutritient Interactions. Marcel Kekker Inc. York.
4. World Reviews of Nutrition and Dietetics.
5. WHO Technical Report Series.
6. Indian Council of Medical Research, Recommended Dietary Intakes for Indians - Latest Recommendations.
7. Indian Council of Medical Research. Nutritive Value O f indian Foods. - Latest Publication.
8. Berdanier, CD. and Harrgrove, JI (ed) (1996): Nutrients and Gene Expression: Clinical Aspects. Boca Raton FL CRC Press.
9. Bacurle, P.A. (ed) (1994) Inducible Gen Expression Part-I: Environmental Stresses and Nutrients Boston: Brikhauser.
10. O. Chandra, R.K. (ed) (1992) Nutrition and Immunology. ARTS Biomedical. St. John's New Foundland
11. Mahan, L.K. & Ecott Stump, S. (2000): Krause's Food Nutrition and Diet Theray, 10th Edition, W.B. Samunders Ltd.
12. 12. Sizer, F & Whitney. E. (2000) Nutrition-Concepts & Controversies 8th Edition. Wadsworth Thomson Learning.
13. Whitney. E.N. & Rolfes, S.R. (1999): Understanding Nutrition, 8th Edition, West/Wadsworth, An international Thomson Publishing Co.
14. 14Ira Wolinksy (Ed) (1998): Nutrition in Exercise and Sports, 3rd Edition. CRC Press.
15. Shils, M.E.: Olson, J.A.; Shike N. and Roos, A.C. (Ed) (1999): Modern, Nutrition in Health and Disease 9th Edition, Williams and Wilkins.
16. McArdle, W.Katch, F. and Katch (1996) Exercise Physiology. Energy Nutrition and Human Performance 4th edition, Williams and Wilking, Philadelphia.

Journals

1. Nutrition Reviews.
2. America Journal of Clinical Nutrition.
3. America Journal of Clinical Nutrition.
4. British Journal of Nutrition.
5. European Journal of Clinical Nutrition.
6. International Journal of Vitamin and Nutrition Research.
7. International Journal of Food Science and Nutrition.
8. Nutrition Research.
9. Ann Nutrition Metabolism.

Department of Higher Education, Govt. of M.P.

Semester wise syllabus for Postgraduates

As recommended by Central board of Studies and Approved by HE the Governor of M.P.

2023-24

M.Sc. (Home Science)

Food and Nutrition

SEMESTER-III

PAPER-II

Clinical and Therapeutic Nutrition

M.M. 50 (Th. 35+ CCE15)

Objectives

The course will be enable the students to:

- Understand the etiology, physiologic and metabolic anomalies of acute and chronic diseases and patient needs.
- Know the effect of the various diseases on nutritional status and nutritional and dietary requirements.
- Be able to recommended and provide appropriate nutritional care for prevention and treatment of various diseases.
- Orient the students with all the important state of the art methodology applied in nutritional assessment and surveillance of human groups.
- Develop specific skill to apply the most widely used method.

UNIT-I

(A) **Role of dietitian**

(a) Responsibilities of nutritional counselor.
(b) Communication of dietary advice, skills of communication.
(c) Motivation of patients.
(d) Teaching aid used in dietary advice.

(B) **Principles of nutritional care**

(i) Nutritional care process
(a) Assessment
(b) Objectives of nutritional care
(c) Implementation of nutritional care
(d) Evaluation of nutritional care.

Sheela Pandey

UNIT II

Nutritional intervention (1) Current methodologies of assessments of nutritional status in clinical situation their implementation and comparative application for the following

A. Food consumption
B. Anthropometry
C. Clinical assessment
D. Laboratory tests

Alpana Dwivedi

(2) Assessment of patients nutritional needs.
   A. Dietary calculations.
   B. Meal exchange system
   C. Diet prescription
(3) Diet Modification
   A. Adequate normal diet as basis for therapeutic diet

UNIT-III

(A) **Nutritional care for hospitalized patients.**

(1) Identification of high risk patients,
(2) Assessment of patients need based on interpretation of patient data clinical biochemical, biophysical etc.
(3) Hospital food service.
(4) Routine hospital diets (a) Regular (b) Light (c) Soft, (d) Fluid
(5) Modes of feeding
(6) External - tube feeding
(7) Parentaral (i) Peripheral vein feeding (ii) Total Parentaral nutrition
(8) Psychological factor in feeding the sick person
(9) Effect of food, nutrients and nutritional status on drug dosage and efficiency.

UNIT-IV

A. **Diet in Disease of endocrine pancreas**
(a) Etiology
(b) Classification
(c) Symptoms and diagnosis
(d) Management clinical vs. Chemical control
(e) Insulin Therapy
(f) Oral hypoglycemic drugs
(g) Glucose monitoring at home
(h) Dietary care with and without insulin
(i) Specific Diabetic food
(j) Sweetness and sugar substitutes
(k) Diabetic coma
(l) Insulin reaction
(m) Patient education

B **Nutritional care in Hypoglycemia**

1. **Hypoglycemia**
(a) Symptoms
(b) Types
   (i) Reactive Hypoglycemia
   (ii) Idiopathic Hypoglycemia
(c) Dietary treatment

2. Infection and fever
(1) Metabolism, effect on body mechanism and classification
(2) Etiology. Pathology symptoms and treatment of
   (a) Acute fever - viral fever
   (b) Chronic fever - typhoid and TB

UNIT-V

(A) **Diseases of gastro intestinal tract causes. Pathogenesis. Symptoms and Dietary management of:**

(1) **Diseases of esophagus**
   (a) Achalasia
   (b) Oesophagitis

(2) **Disease of stomach**
   (a) Indigestion
   (b) Gastritis
   (c) Peptic ulcer
   (d) Esophagitis

(3) **Disease of intestine**
   (a) Constipation
   (b) Diarrhea
   (c) Hemorrhoids
   (d) Steatorrhoea

(4) **Inflammatory diseases of bowel.**
   (a) Divertricular disease
   (b) Ulcerative Colitis

(5) **Malabosorption Syndrome**
   (a) Sprue
   (b) GIT enzyme deficiency

Practical : **M.M. 50**

1. Interpretation of patient data and diagnostic tests and drawing up of patient diet prescription using a case study approach.
2. Follow up acceptability of diet prescription, compliance, discharge diet plan
3. Calculation of percent energy supplied by carbohydrate in the diet.
4. To find out the high fiber products available in market and critically evaluate the content.
5. Evaluation of protein quality of food preparations.
6. Planning, calculation and preparation of diets mentioned in theory.
7. Nutritional supplement, nutritional support substrats.
8. Préparation of diet councelling aids for common disorders.

Academic Council
Approved

References:

1. Manual of Dietetics Practice - Brony Thomas
2. Nutrition in Health and Disease - Anderson
3. Normal and Therapeutic Nutrition - C.H. Robinson
4. Basic Nutrition and Diet Therapy - William 10/c
5. Nutrition and Diet Therapy - William 10/c
6. Food Nutrition and Dietetics - URVI
7. Nutrition and Diet Therapy - Stanfield
8. Modern Nutrition in Health and Disease - Robert S. Goodhart
9. Nutrition Principles and Clinical Practices - Sara M. hunt and James.
10. Nutrition in Critical Care - Zaroga
11. Fundamentals of Clinical Nutrition 93 - Weinster
12. Dietetics - Shrilaxmi
13. Nutrition and Dietetics - Shubhangini Joshi
14. Human Nutrition and Dietetics - Davidson Passmore
15. Clinical Dietetics and Nutritional - F.P. Antia
16. Textbook of Nutrition and Dietetics - Kumud Khanna Etal
17. Mohan, L.K. and Excott Stump (2000) Krause's Food Nutrition Diet Therapy 10th Edition W.B. Saundes Ltd. Shils. M.F. Olson. J.A. Shike M. and Ross A.C. (1999)
18. Modern Nutrition Health and Disease 9th Edition Williams and Wilkins

Sheela Pandey

Department of Higher Education, Govt. of M.P.

Semester wise syllabus for Postgraduates

As recommended by Central board of Studies and Approved by HE the Governor of M.P.

2023-24

M.Sc. (Home Science)

Food and Nutrition

SEMESTER-III
PAPER-III
Food Science & Current Trends

M.M. 50 (Th. 35+ CCE 15)

Objectives :

This course is designed to:

- Provide an understanding of composition of various foods stuffs.
- Familiarize students with changes occurring in various foodstuffs as a result of processing and cooking.
- Enable students to use the theoretical knowledge in various application and food preparations.
- Create awareness regarding current trends, issues and researches in various aspects of food and nutrition.

UNIT-I

Introduction of Food Science: Development of Food Science as a discipline.

Colloids - Colloidal salts, stabilization of colloidal systems.

- Gels structure, formation and stabilization
- Emulsions; formation, stability - surfactants and emulsifier.
- Foams

UNIT-II

Starch: Structure, gelatinization, methods for following gelatinization changes. Characteristics of some food starches. Effect of ingredients and conditions on gelatinization. Modified food starches.

- **Non-starch Polysaccharides**: Cellulose, Hemicelluloses, Pectin's, gums, animal polysaccharide.

UNIT-III

- **Sugar and Sweeteners**: Sugars, syrups, alcohols, potent sweeteners, sugar products. Alternative sweeteners, Browning.
- **Reactions of sugar**: Caramelization, Hydrolysis, Crystallization, Indian Confectionery.

UNIT-IV

Fruits and Vegetables

- Enzymes in fruits and vegetables.
- Classification and nature of Enzymes, Stability and action.
- Biotechnological applications of enzymes in food.

- Natural pigments and natural colors used in food.

UNIT-V

Cereals and Cereal Products:

- Cereal grains: Structure and Composition.
- Cereal products.
- Flours and flour quality.
- Extruded foods breakfast cereals wheat germ, bulgur, puffed and flaked cereals.

Practical: **M.M. 50**

Prepare one recipe for each given practical below and identify the functional properties of the foods given below.

1. **Sugar:** Caramelization, crystallization, Syrups factors affecting crystal formation. Preparation of standardized chikky, laddos, gulabjamun, jalebi, Shakarparas, chocolates.

2. **Starches:** Gelatinization to see the effect of soaking time on the quality of rice. To study the formation of gluten.

3. **Jams and Jellies:** Pectin content of fruits, jam and jelly formation.

4. **Fruits and vegetable:** Effect of acid and alkali on vegetables and fruits and estimation the pH value of fruits and vegetables.

5. **Cereals:** Effect of soaking time on the quality of dhal and rice. Gluten formation in batters and doughs

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M.Sc. (Home Science)

Food and Nutrition

SEMESTER-III

PAPER-IV

Issues Related to Women's Health

M.M. 50 (Th. 35+ CCE 15)

UNIT-I

Women and Work:

Environments stress, production activates, Nutrition, Health and gender, living condition, Occupational health, Health facilities.

UNIT-II

(A) Current Nutrition and Health Status of Women and Children in India

(B) Policies and programmes for promoting maternal and child nutrition

UNIT-III

(A) Effect of urbanization on Women.

Impact of economic policies. industrialization, and globalization on women.

UNIT-IV

Policies and Legislations.

A. CEDAW (Conventions on Eliminations of all forms of Discriminations Against Women)

B. WRLH (Women's Right to Life and Health)

UNIT-V

A) **Empowerment of women**

Role of Education and various National Schemes.

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Science for Women (Autonomous)
Jabalpur M.P.

SYLLABUS: 2023-24

M.Sc. IV Semester

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2023-24

M.Sc. (Home Science)
Food and Nutrition

SEMESTER-IV

PAPER-I -Health and Fitness

M.M. 50(Th. 35+CCE15)

Objectives

- Understand the components of health and fitness and the role of nutrition in these.
- Make nutritional, Dietary and physical recommendations to achieve fitness and well-being.
- Develop ability to evaluate fitness and well being.

UNIT-I

(A) **Body Composition**

(1) Methods

(a) Chemical analysis.
(b) Nutritional anthropometry
(c) Skin fold Thickness
(d) Body density
(e) Dilution Technique
(f) $^{40}K^{40}$ Analysis

(2) **Compositional changes concept**

(a) Human fetal development
(b) Material weight gain - Distribution composition
(c) Compositional changes between birth and maturity
(d) Compositional changes with weight changes: Physical activity.

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UNIT-II

(A) Holistic approach to the management of fitness and health: Energy input and output, Diet and Exercise, Effect of specific nutrients on work performance and physical fitness. Nutrition, Exercise, Physical fitness and health inter-relationship.

(B) Review of different energy system for endurance and power activity Fuels and nutrients to support physical activity. Shifts in carbohydrate and fat metabolism. Mobilization of fat stores during exercise.

(C) **Nutrition in Sports:** Sports specific requirements. Diet manipulation. Pre-game and Post game meals. Assessment of different nutragenic aids and commercial supplements. Diets for persons with high energy requirement, stress, fracture and injury.

(D) Water and Water electrolyte balance: losses and their replenishment during exercise and sports events, effects of dehydration, Importance of sports drinks.

UNIT-III

(A) Nutritional regulation of Gene Expression

(B) Non Nutritive food components with potential health effects; Polyphenols, tennins, phytates, phyto estrogens, cynogenic compounds, lecithins and saponins.

UNIT-IV

(A) Alternative systems for health and fitness like ayurveda yoga, meditation, vegetarianism and traditional diet.

(B) Nutrition Management in special conditions: Space travel, high altitudes, low temperatures submarines.

(C) Diets for persons with high energy requirement, stress.

UNIT-V

(A) Inborn Errors of Metabolism- Sickle Cell Anemia, Thallasaemia, Cystene Urea, Phenylketonuria, Hereditory lactose intolerance, gout

(B) Defining nutrition goals/guidelines appropriate to health, fitness and prevention and management of Chronic degenerative disease diabetes mellitus, CV disorders, bone, health and cancer

(C) Nutrition and exercise regimes for pre and post natal fitness.

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Food and Nutrition

SEMESTER-IV

PAPER-II –Clinical & Therapeutic Nutrition

M.M. 50(Th. 35+CCE15)

Objectives

Understand the etiology, physiologic and metabolic anomalies of acute and chronic diseases and patient's need.

Know the effect of various diseases on nutritional status and nutritional and dietary requirement.

Be able to recommend and provide appropriate nutritional care for preventions and treatment of various diseases.

Orient the students with all the important state of art methodology applied in Nutritional assessment and surveillance of human groups.

Develop specific skills to apply the most widely used methods

UNIT-I

(A) Overweight and obesity.

1. Definition
   a) Classification
   b) Assessment
   c) Causes, Physiology of obesity, mathematics of weight reduction.
2. Treatment of obesity
   a) Dietary management and calorie restriction plans
   b) Exercise
   c) Other approaches of weight reduction.

(B) **Underweight**

(1) Definition
   a) Criterion
   b) Etiology

(2) Treatment
   (a) High calorie diet

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Unit II

Diseases of liver, exocrine pancreas and biliary system: Physiology Etiology, Pathogenesis, Symptoms and Management

1. **Liver diseases**
   - Cirrhosis
   - Viral hepatitis
   - Hepatic coma
   - Wilson's disease
2. **Disorder related to gall bladder**
   - Cholecystitis
   - Gall stones
3. **Disorders related to pancreas**

Unit III

A. Nutritional care in Cardio-vascular disorders.

1. **Hypertension-**
   a) Definition.
   b) Criterion
   c) Types
   d) Causes
   e) Nutritional Management
   f) Drugs.
2. **Hyperlipidemia**
   a) Lipoproteins and their metabolism
   b) Classification of hyperlipidemia
   c) Clinical and Nutritional aspects of hyperlipidemia.
   d) Dietary Care
3. **Coronary Heart Diseases (CHD)**
   a) Atherosclerosis-
      i) Etiology
      ii)Pathogenesis
   b) Risk factors associated with CHD
   c) Management of CHD
      i) Dietry Management
      ii) Exercise
   d) Prevention of CHD

B. Cerebrovascular disorder and nutritional management

Unit IV

A. **Nutritional care for patient with diseases of Kidney**
- (1) Review of physiology and function of normal kidney
- (2) Nephritis
  - (a) Classification
  - (b) Etiology
  - (c) Characteristics
  - (d) Nutritional care and management

B. **Nephrotic syndrome**
- (a) Etiology
- (b) Characteristics
- (c) Nutritional care and management

C. **Acute and Chronic renal failure**
- (a) Etiology
- (b) Types
- (c) Nutritional care and management

UNIT V

Nutritional care for patients having surgery and burns

(A) **Surgery**
- (1) Pre operation nutritional care
- (2) Post operative nutritional care
  - a) Gastric surgery
  - b) Gall bladder surgery
  - c) Colon surgery
  - d) Tonsil surgery
  - e) Esophagus surgery

(B) **Burns**
- (1) Fluid and electrolyte replacement
- (2) Nutritional care
- (3) Rehabilitation

(C) **Cancer**
- (1) Dietary factors and cancer causation
- (2) Cancer treatment: Radio therapy, surgery and chemotherapy
- (3) Alternative or complementary diets
- (4) Prevention

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Practical: **M.M. 50**

a) Planning calculation and preparation of diets mentioned in theory
b) Evaluation of protein quality of food preparations.
c) Dietary calculation using food exchange.
d) Preparation of diet counseling aids for common disorders.
e) Spotting.
f) Calculation of percent energy supplied by carbohydrate in the diet.

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Food and Nutrition

SEMESTER-IV

PAPER-III

Food Science & Current Trends

M.M. 50 (Th. 35+ CCE 15)

UNIT-I

A. **Pulses and Legumes:** Classification, composition, Denaturation, non-enzymatic browning. Functional properties of whole pulses and legumes, germination and sprouting. Factors affecting cooking quality of pulses and legumes.

B. **Leavened Products:** Leavening agents, biologically leavened and chemically leavened products. Fermentation process and fermented product. Bread Pastry Biscuits and Cookies

Unit II

Milk and Milk Product: Composition, Physical and functional properties. Denaturation, effects of processing and storage and Diary Products: Cultured milk, yogurt, butter, whey cheese concentrated and dried products , Frozen desserts , daily product substitute.

Unit III

A. **Spices and Condiments:** Composition, Flavoring extracts natural and synthetic.

B. **Eggs:** Structure and composition. Changes during storage. Functional properties of eggs use in cookery. Egg Processing. Low Cholesterol egg substitutes.

Unit IV

A. **Fats, Oils and Related Products:** Nuts and Oils seeds, Sources, Composition, effects of composition on fat properties. Functional properties of fat and uses in food preparations. Fat substitutes Fat deterioration and antioxidants.

B. **Meat and Poultry:** Muscle composition, Characteristics and structure. Post mortem changes. Processing, Preservation and their effects. Heat induced changes in meat. Variables in meat preparation. Tenderizers. Meat Products.

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UNIT V

A. **Browning reaction in foods:** Enzymatic and non enzymatic. Its advantages and disadvantages, prevention.

B. **Biotechnology in Food:**
- Algae as food spirulina
- Organic food
- Nutraceuticals

Practical: **M.M. 50**

Food Science

Prepare one recipe for each given practical below and identify the functional properties of the foods given below

1. **Egg:** Emulsion, thickening. Binding, coagulation, coating, foaming of egg white
2. **Pluses:** Germination and sprouting
3. Colloidal systems of foods, formation of sol, gel and emulsion.
4. **Leavening agents:** Use of leavening agents cookery. Cakes, biscuits and cookies, fermentation and fermented products.
5. Fat and oils- melting point and smoking point, permanent and semi permanent emulsions, fat absorption and its measurement, khasta, pastry.
6. **Milks and Milk Products:** Scalding of milk, precipitation of curd, paneer, khoa, cheese, butter and fermented milk.

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SEMESTER-IV
PAPER-IV - Nutrition and Health of Child and Elderly

M.M. 50 (Th. 35 + CCE15)

UNIT-I

Maternal Health

(a) Disease pattern and Reproductive health.
(b) Women-pregnancy and lactation.
(c) Safe Motherhood.
(d) Care of at-risk mothers.
(e) Malnutrition in mothers and children: Etiology and management (in brief).

UNIT-II

Issues related to Child Nutrition

(a) Infant Physiology and pre-term and low birth weight infants- Implication for feeding and management.
(b) Growth and development during infancy, childhood and adolescence.
(c) Feeding of infants and children and dietary management

UNIT-III

Issues related to Elderly

a) The ageing process Physiological, biochemical and body composition changes.
b) Theories of ageing

UNIT-IV

a) Socio Psychological aspects of ageing especially problems of elderly women

b) Nutritional requirement of elderly and dietary management to meet nutritional needs.

UNIT-V

(a) Chronic degenerative diseases and nutritional problems of elderly their etiopathogenesis, management, prevention and control.

(b) Policies and programmes of government and NGO sector pertaining to the Elderly.