

MSc I<sup>st</sup>

Department of Higher Education Govt. of M.P.  
Semester Wise Syllabus for Postgraduates  
As recommended by Central Board of Studies and  
Approved by HB the Governor of M.P.

Department of Higher Education, Govt. of M.P.  
Semester wise syllabus for Postgraduates  
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M.Sc. (Home Science)  
Food and Nutrition

SEMESTER-I  
PAPER-I  
Applied Physiology

M.M. 50

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, organelles  
**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, leukopoiesis, Formation and functions of plasma proteins Factors influencing erthropoiesis - 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 anti bodies. Disorders - Immune deficiency, Hypersensitivity.
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. MG
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<sub>2</sub> and CO<sub>2</sub>. 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 section, 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.

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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 Physiociology, 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, Priser 3ooks (Pvt.) Ltd. Bangalore.
  5. Wilsion, 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.
- Jain, A.K. Textbook of Physiology, Vol I and II. Avichal Publishing Co. New Delhi 8. Text book of physiology Vol I & II

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M. Sc. (Home Science)  
Food and Nutrition

SEMESTER-I  
PAPER-II  
Advanced Nutritional Biochemistry

**Objectives:**

M.M.: 50

- Augment this Biochemistry knowledge acquired at the undergraduate level.
- Understand the mechanism adopted by the human body for regulation of metabolic pathways.
- Get on 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 protein-** nature, properties and functions. Purines, and pyrimidines: synthesis and breakdown.

**UNIT-II**

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

**UNIT-III**

*glucogenesis, glycogenesis.*

1. **Carbohydrates:** glycolysis, glucogenesis, citric acid cycle, hexose monophosphate pathways and gluconeogenesis.

**Lipids:** Beta-oxidation, de novo synthesis of fatty acids. Synthesis and breakdown of unsaturated fatty acids. Cholesterol, phospholipids and triacylglycerol significance.

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UNIT-IV

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

*Nucleic*

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

*Synthesis*

UNIT-V

*Hormones*

**Hormones:** Mechanism of action. Negative feedback, hormone receptor, cellular messengers.

*Intracellular*

**Conversion of amino acids to specialized products**

*Conversion*

**M.Sc. (Home Science)**  
**Food and Nutrition**

**SEMESTER - I PAPER-I & II**  
**Human Physiology & Advanced Nutritional Biochemistry**

**Practical-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)**

- ✓ **Protein:** (a) Estimation of proteins in foodstuff: —  
(b) Estimation of albumin, globulin and A: G ratio in serum and urine  
Estimation of glucose in blood and urine

**Glucose** Estimation of glucose in blood and urine.  
**Lipid** Estimation of lipid in food by soxholet extraction method.

**Calcium** Estimation of calcium in food and serum

**Phosphorus** Estimation of inorganic- phosphorus in food and serum.

**Buffer** Preparation of phosphate, carbonate and acetate buffer and determination of their pH values.

✓ **Survey** Survey of pathological laboratories to obtain information about different methods uses in blood serum anylis.

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M.Sc. (Home Science)  
Food and Nutrition

**SEMESTER-I**

**PAPER-III- Public Nutrition**

**M.M. 50**

**Objectives**

Develop a holistic knowledge base and understanding of public nutrition concept.

Understand the health economic, food situations and determinations of nutritional status.

Be familiar with various approaches to nutrition and health interventions, programmes and policies.

**UNIT-I**

**Concept of Public Nutrition**

Definition and concepts of health. Determinants of Health

Relationship with health and nutrition.

Role public nutritionists the health care delivery.

Population dynamics: Demographic transition population structures fertility behavior. Nutrition and quality of life.

**UNIT-II**

**Food and Nutrition security**

(a) Food production. Access, Distribution, Losses and consumption

**Nutritional Status**

(a) Determinants of nutritional status

(b) (i) Nutrition Indicators - Functional indicators such as grip strength respiratory fitness Harvard step test, squatting test

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

(c) Monitoring & Evaluation

**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 evolution.

#### 1. Nutrition Education

- (a) Definition, purpose, importance  
(b) Methods and tools  
(c) Channels of nutrition education  
(d) Evaluation of nutrition education

### UNIT-V.

#### 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 centres.  
(c) Health Care Systems.



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M.Sc. (Home Science)  
Food and Nutrition

PRACTICAL-II  
Public Nutrition  
First Semester

M.M. 50

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

Development of methods and tools of nutritional education

Plan prepare and calculate one dish meal specific to your own region for

- (a) Pregnant woman
- (b) Lactating mother

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.

Dietary Assessment

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

Case study of existing intervention programme in voluntary and government sector. G, A

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

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- Park, K.L. (2000) Park's Textbook of Preventive and Social Medicine, 18th Edition M/s Banarasidas Bhanat, Jabalpur.
- SCN News; UNACC/SCN Subcommittee on Nutrition.
- State of the World's Children. UNICEF
- Census Reports**
- Berg A (1973): The Nutrition Factor the Brookings Institution. Washington.
- Gaston, G.H. and Bengoa. J.M. (Eds.) (1986): Nutrition in Preventive Medicine WHO.
- Banjil M.S. Rao, P.N. Reddy, V. (Eds.) (1996) Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
- Gopalan, C. And Kaur, S (Eds) (1993) Towards Better Nutrition, Problems and Policies, Nutrition foundation of India.
- Gopalan C. (Ed) (1987) interfaces between Agriculture Nutrition and Food Science, the United Nations University.
1. Gopalan, C. (Ed) (1987) Combating Under nutrition - Basic Issues and Practical Approaches, Nutrition Foundation of India.
2. Acl. aya, K.T. (Ed.) (1987) interfaces. Between Agriculture Nutrition and Food Science, the United Nations University.
- National Family Health Survey I & III (1993-2000) International Institute for Population Studies Mumbai.
3. National Plan of Action of Nutrition Board, Dept. of WCD Govt. of India.
4. National Nutrition Policy (1993) WCD, Govt. of India.
5. Nutrition Education for the Public (1940: FAO Food and Nutrition Paper 62 FAO
16. Allen, L. And Ahluwalia N. (1997) Improving Iron Status through Dist. Application of knowledge correcting Dietary Iron Bio availability in Human Population OMN I/US AID Arlington, VA USA.
17. Nestel, P. (ed.) (1995) Proceeding: Interventions for Child Survival OMNI/USAID Arlington, Arlington VA. USA.
18. Documents and Reports published by the intervention Vitamin A consultative Group.

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Semester Wise Syllabus for Undergraduates  
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## FOOD & NUTRITION

M.Sc. - 1ST SEMESTER

COURSE -IV

RESEARCH METHODS AND STATISTICS

Marks : 50

### OBJECTIVES :

- To understand the significance of statistics and research methodology in Home Science research.
- To understand stand 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, case study, social research, observation research.

#### UNIT-II MS

- Definition and identification of a Research Problem.
  - Selection, justification & limitation of research problem.
  - Hypothesis - meaning nature, characteristics, types & functions of hypothesis.
  - Variables : Meaning, nature, type & selection of variables.

### UNIT-III

*Sampling*  
Sampling methods -

Population and sample

Probability & semi probability sampling - simple random, systematic random sampling, two stages and multi stage sampling, cluster sampling.

Non-Probability sampling : purposive, quota and volunteer sampling.

Merits & Demerits Sampling.

### UNIT - IV

*Research*

Research Design

Meaning, features concept & purpose of research design.

*Qualitative*  
Qualitative research Method

Definition Theory design types reliability & validity of :-

- (i) Case study
- (ii) Interview
- (iii) Observation

### UNIT - V

*Quantitative*

Quantitative research method

Definition theory design types reliability & validity of

- (i) Socio metric scale
- (ii) Questionnaire
- (iii) Schedule.

Writing a research report

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M.Sc. (Home Science)  
Food and Nutrition

SEMESTER-II  
PAPER-I  
Advance in Food Microbiology

Objectives

M.M. 50

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

##### VK 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

##### SQ Estimation and Isolation of Micro Organisms:

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

- single plate  
preservation
- Conventional methods; SPC
  - Immunological Methods: RIA, ELISA, FIA
  - Chemical Method: ATP measurement and PCR (Polymers-Chain Reaction)
  - Rapid methods (new techniques)
2. Microscope colony count, Analysis, DMC (Direct Micro Scopic Count). *by plate count*
  3. Estimation of the number 'O' Microorganisms, MPN (Most Probable Numbers)

### UNIT-III

BC1

#### 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 cammed foods.
2. Foods, Bore diseases: (Bacterial and Virus) Signs/Symptoms and prevention
  - Staphylococcal Gastro enteritis
  - Clostridium perfinger
  - Botulinum and Vibro
  - E-Coil, Salmonella, Shigellae
  - Poliomyelitis
  - Infectious Hepatitis.

### UNIT-IV

BC1

#### 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

MS

#### 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:*

1. Topley and Wilsons (1983) Principles of Bacteriology, Virology and Immunity, Edited by S.S. Wilson, A Miles and M.T. Parker, Vol. I: General Microbiology and Immunity, II: systematic Bacteriology, 7th Edition. Edward Arnold Publisher.
2. Block, J.G. (1999) Microbiology Principles and Explorations, 4th Edition John Wiley and Sone Inc.
3. Frazier, W.C. (1988) Food Microbiology, Mc Graw hill Inc. 4th Edition.
4. Jay, James, M. (2000) Modern Food Microbiology, 6th Edition. Aspen Publishers, Inc. Maryland.
5. Banwant, G. (1989) Basic Food Microbiology, 2nd Edition CBS Publisher.
6. Garbutt, J. (1997) Essentials of Food Microbiology, 1st Edition, Arnold International Students Edition.
7. Doyle, P. Benehat, L.R. and Mantville, T.J. (1997): Food Microbiology, Fundamentals and Frontiers, ASM Press Washington DC.
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.

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M.Sc. (Home Science)  
Food and Nutrition

SEMESTER-II  
PAPER-II  
Applied Biochemistry and Technique

M.M. 50

**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.
3. Get an insight into interrelationship between various metabolic pathways.
4. Become proficient for specialization in nutrition.
5. Understand integration of cellular level metabolic events to nutrition disorder and imbalances.
6. Understand the principals of various analytical for nutrition research.
7. Familiarize with the application of the above techniques.

**UNIT-I**

75 Vitamins and trace elements in the function of enzymes.

Detoxification in body metabolism of foreign compounds

**UNIT-II**

61 Membrane structure assembly and function.

Hemoglobin and its metabolism.

**UNIT-III**

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



#### UNIT-IV

B7 Electrophoresis - principles and applications in paper and gel electrophoresis. Chromatography principals and applications in paper (circular, ascending and descending) ion exchange column thin layer gas liquid and high performance Chromatographic techniques.

Isotopes and their use radio active and stable isotopes.

Immunological method RIA and ELISA.

#### UNIT-V

B7 [Bioenergetics and metabolism a survey of metabolism anabolic catabolic pathways, their differences role of ATP cycle in bioenergetics.] *Bio Tech*

[Biological oxidation respiratory chain oxidative phosphorylation]

~~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 (15 Section 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.  
*Acid fast, Spore, Capsule, Flagella, Motility*
3. Staining of yeast and molds.  
*Glycerol*
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 un processed 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.  
*Microbiology, Food Microbiology, (Practical)*

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Food and Nutrition

SEMESTER-II  
PAPER-III  
Nutrition and Health Problems

M.M. 50

**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**

BG 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.

VK **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.

**Section-B (Any five)**

1. Ascorbic acid: Estimation of ascorbic acid in foods.
2. Cholesterol: Estimation 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. *G-240-2112*
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.

VK

### 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) Preventive of HIV infection

MS

### 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 *goitre, cretinism, myxoedema*

Rickets osteomalacia and osteoporosis

Fluorosis

MS

### 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.

**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 pre school 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.
6. Develop a suitable teaching aid to increase awareness regarding AIDS, Drug abuses and anaemia among college going girls through lectures, Posters, charts, etc.

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

**II<sup>ND</sup> SEMESTER**  
**PAPER – IV**  
**STATISTICS & COMPUTER APPLICATION**

**Marks : 50**

**OBJECTIVES**

- To understand the role of statistics and computer applications in research.
- To apply statistical techniques to research data for analyzing and interpreting data meaningfully.

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

**UNIT - I**

- Classification and tabulation of data.
- Graphic presentation, Frequency distribution, Histogram, frequency, polygons, Ogive
- Average of position in individual, discrete and continuous series.

**UNIT-II**

- **Normal** distribution - Characteristics, deviation from normality
- Measures of variability - range quartile deviation, Mean Deviation, Standard Deviation or SD.

**UNIT-III**

- Testing of hypothesis, Type I and Type II errors.
- Non parametric Methods Chi-square test, Application of student T test for Small samples. Difference in proportion for means and difference in means – Critical ratio.

**UNIT-IV**

- Correlation -. Meaning, types.
- Coefficient of correlation by Scatter diagram, rank correlation, product Movement method

- Analysis of variance - nature use & basic Concept one and Two-way.

### UNIT - V

- Experimental Designs - Nature, types - Single group-two group-Control & Experimental Group.
- Randomized block design
- Latin square design
- Factorial design

TOTAL MARKS: 25

### PRACTICAL I

#### STATISTICS & COMPUTER APPLICATION

1. Tabulation.
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, Henry E. (1971) Statistics in Psychology and education, David Hele Co.
- Edwards : Experimental Design in Psychological research
- Kerlinger: Foundation of Educational Research.
- SPSS/PC for the IBM PC/Xt. SPSS Inc.
- Goyal Mathematics 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



Class / कक्षा	: M.Sc. (H.Sc.)
Semester / सेमेस्टर	: III
Subject / विषय	: Food and Nutrition
Title of Subject Group विषय समूह का शीर्षक	: Advanced Nutrition
Paper No. / प्रश्नपत्र क्रमांक	: I
Compulsory / अनिवार्य या Optional / वैकल्पिक अनिवार्य	: Compulsory
Max. Marks अधिकतम अंक	: 35
	Particulars / विवरण

**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 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-1	<b>Energy:</b> 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-2	<b>Carbohydrates:</b> Digestion and transpost review-dietary fibre fructooligosaccharides resistant starch-chemical composition and physiological effects, Glycemic index of foods. Sweeteners-nutritive and non-nutritive.
Unit-3	(a) <b>Protein:</b> Digestion, absorption transpost-review .Protein quality; methods of evaluation protein needs. Therapeutic application of specific amino acids: Branched chain, amino acids and others.
Unit-4	<b>Lipids:</b> Digestion, absorption transport review. Functions of essential fatty acids. Role of n-3, n-6 fatty acids. Prostaglandins. Fat requirements.
Unit-5	<b>Water:</b> Regulation of intra and extra cellular volume osmolality, water balance and its regulation.

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 स्नातकोत्तर कक्षाओं के लिये सेमेस्टर अनुसार पाठ्यक्रम  
 केंद्रीय अध्ययन मण्डल द्वारा अनुशंसित तथा म. प्र. के राज्यपाल द्वारा अनुमोदित  
**Sesion 2010-2011**

Class / कक्षा	: M.Sc. (H.Sc.)
Semester / सेमेस्टर	: III
Subject / विषय	: Food and Nutrition
Title of Subject Group विषय समूह का शीर्षक	: Dietetics and Therapeutic Nutrition
Paper No. / प्रश्नपत्र क्रमांक	: II
Compulsory / अनिवार्य या Optional / वैकल्पिक	: Compulsory
Max. Marks अधिकतम अंक	: 35

**Particulars / विवरण**

**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.

<b>Unit-1</b>	<p>(A) Role of dietitian</p> <p>(a) Responsibilities of nutritional counselor.</p> <p>(b) Communication of dietary advice, skills of communication.</p> <p>(c) Motivation of patients.</p> <p>(d) Teaching aids used in dietary advice.</p> <p>(B) Principles of nutritional care</p> <p>(i) Nutritional care process</p> <p>(a) Assessment</p> <p>(b) Objectives of nutritional care</p> <p>(c) Implementation of nutritional care</p> <p>(d) Evaluation of nutritional care.</p>
<b>Unit-2</b>	<p>A) Nutritional intervention</p> <p>(1) Current methodologies of assessments of nutritional status in clinical situation their implementation and comparative application for the following</p> <p>(a) Food consumption</p> <p>(b) Anthropometry</p>

	<ul style="list-style-type: none"> <li>(c) Clinical assessment</li> <li>(d) Laboratory tests</li> </ul> <p>(2) Assessment of patients nutritional needs.</p> <ul style="list-style-type: none"> <li>(a) Dietary calculations.</li> <li>(b) Meal exchange system</li> <li>(c) Diet prescription</li> </ul> <p>(3) Diet Modification</p> <ul style="list-style-type: none"> <li>(a) Adequate normal diet as bases for therapeutic diet</li> </ul>
<b>Unit-3</b>	<p>(A) Nutritional care for hospitalized patients.</p> <ul style="list-style-type: none"> <li>(1) Identification of high risk patients.</li> <li>(2) Assessment of patients need based on interpretation of patient data clinical biochemical, biophysical etc.</li> <li>(3) Hospital food service.</li> <li>(4) Routine hospital diets (a) Regular (b) Light (c) Soft, (d) Fluid</li> <li>(5) Modes of feeding</li> <li>(6) External - tube feeding</li> <li>(7) Parenteral (i) Peripheral vein feeding (ii) Total parenteral nutrition</li> <li>(8) Psychological factor in feeding the sick person</li> <li>(9) Effect of food, nutrients and nutritional status on drug dosage and efficiency.</li> </ul>
<b>Unit-4</b>	<p>(A) Overweight and obesity</p> <ul style="list-style-type: none"> <li>(1) Definition <ul style="list-style-type: none"> <li>(a) Classification</li> <li>(b) Assessment</li> <li>(c) Causes, Physiology of obesity, mathematics of weight reduction.</li> </ul> </li> <li>(2) Treatment of obesity <ul style="list-style-type: none"> <li>(a) Dietary management and calorie restriction plans</li> <li>(b) Exercise</li> <li>(c) Other approaches of weight reduction.</li> </ul> </li> </ul> <p>(B) Underweight</p> <ul style="list-style-type: none"> <li>(1) Definition <ul style="list-style-type: none"> <li>(a) Criterion</li> <li>(b) Etiology</li> </ul> </li> <li>(2) Treatment <ul style="list-style-type: none"> <li>(a) High calorie diet</li> </ul> </li> </ul> <p>(C) Infection and fever:-</p> <ul style="list-style-type: none"> <li>(1) Metabolism, effect on body mechanism and classification</li> <li>2) Etiology. Pathology symptoms and treatment of <ul style="list-style-type: none"> <li>(a) Acute fever - viral fever</li> <li>(b) Chronic fever - typhoid and TB -</li> </ul> </li> </ul>
<b>Unit-5</b>	<p>(A) Diseases of gastro intestinal tract causes. Pathogenesis. Symptoms and Dietary management of:</p> <ul style="list-style-type: none"> <li>(1) Diseases of esophagus <ul style="list-style-type: none"> <li>(a) Achalasia</li> <li>(b) Oesophagitis</li> </ul> </li> <li>(2) Disease of stomach <ul style="list-style-type: none"> <li>(a) Indigestion</li> <li>(b) Gastritis</li> <li>(c) Peptic ulcer</li> </ul> </li> <li>(3) Disease of intestine</li> </ul>

	(a) Constipation
	(b) Diarrhea
	(c) Hemorrhoids
	(d) Steatorrhoea
(4)	Inflammatory diseases of bowel.
	(a) Diverticular disease
	(b) Ulcerative Colitis
(5)	Malabsorption Syndrome
	(a) Sprue
	(b) G-IT enzyme deficiency

**Practical :****M.M 50**

1. Calculation of percent energy supplied by carbohydrate in the diet.
2. To find out the high fibre products available in market and critically evaluate the content.
3. Evaluation of protein quality of food preparations..
4. Dietary calculation using food exchange.
5. Planning, calculation and preparation of diets mentioned in theory.
6. Nutritional supplement, nutritional support substrats.

**Suggested Readings :**

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 & Clinical Practices M. hunt 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
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

Class / कक्षा	
Semester / सेमेस्टर	: M.Sc. (H.Sc.)
Subject / विषय	: III
Title of Subject Group	: Food and Nutrition
विषय समूह का शीर्षक	: Food Science
Paper No. / प्रश्नपत्र क्रमांक	: III
Compulsory / अनिवार्य या Optional / वैकल्पिक अनिवार्य	: Compulsory
Max. Marks अधिकतम अंक	: 35

Particulars / विवरण	
Unit-1	<p><b>Introduction of Food Science and Modern Development in Food Science</b></p> <p><b>(a) Physico chemical properties of food.</b></p> <ul style="list-style-type: none"> <li>▪ Colloidal salts, stabilization of colloidal systems.</li> <li>▪ Gels structure, formation and stabilization</li> <li>▪ Emulsions; formation, stability surfactants and emulsifier.</li> <li>▪ Faams</li> </ul>
Unit-2	<p><b>(a) Functional Role of Sugar in Food</b></p> <ul style="list-style-type: none"> <li>▪ Sugar and Sweeteners: Sugars, syrups alcohols, potent sweeteners, sugar products. Alternative sweeteners. Browning.</li> <li>▪ Reactions of sugar: Caramelization, Hydrolysis, Crystallization.</li> </ul>
Unit-3	<p><b>(a) Starch and Non-starch: Structure, gelatinization, methods for following gelatinization changes.</b></p> <ul style="list-style-type: none"> <li>▪ Non-starch Polysaccharides: Cellulose, Hemicelluloses, Carboxymethyle cellulose (CMC)</li> <li>▪ Classification of hydrocolloids by function- Pectin's gums.</li> <li>▪ Characteristics and functional properties of Modified Starches.</li> <li>▪ Use of Modified starch in food Industry.</li> </ul>
Unit-4	<p><b>(a) Fruits and Vegetables:</b></p> <ul style="list-style-type: none"> <li>▪ Enzymes in fruits and vegetables.</li> <li>▪ Classification and Nature of enzymes, stability and action.</li> <li>▪ Biotechnological application of enzymes in food.</li> <li>▪ Natural Pigments and natural color used in food.</li> </ul>
Unit-5	<p><b>(a) Cereals and Cereal Products:</b></p> <p>Cereal grains: Structure and Composition.                      Cereal products.                      Flours and flour quality.                      Extruded foods breakfast cereals wheat germ, bulgur, puffed and flaked cereals.</p>

**Practical :**

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

1. **Sugar**- Caramelization, crystallization syrups.
2. **Starches**- Gelatinization.
3. **Jams and Jellies**- Pectin content of fruits, jam and jelly formation.
4. **Fruits and vegetables**- Effect of acid and alkali on vegetable 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.

**Suggested Readings :**

1. Food Science- Shri Laxmi.
2. Food Science and Principles- SManey.
3. Food Science- Halen Charlies.
4. Food Prepration- Peckham.
5. Food Science- Niemann Potter.
6. Food Science- Mudambi.
7. Introductory food- Bennian Hughes.
8. Food Chemistry- Mayer.
9. Food Proccessing- Marwaha & Arora.
10. Food Proccessing and Preservation – Subblaxmi.
11. **Biotechnology and Food ingredients**- Goldberg.
12. Food Science Munual- Mohini Sethi & Iram Rao.
13. Experimental Cookery – Palmer
14. Experimental Cookery – Belly & Lowe.
15. Egg: Emulsion, thickening, binding, coagulation, coating, Foaming of egg white.
16. Pulses- Germination sprouting.
17. Colloidal system of foods- Formation of Sol, gel emulsion.
18. Leavening agents- Use of Leavening agents in cookery. Fermentation and fermented products
19. Fruits and vegetables- Effect of acid and alkali on vegetable and fruits and estimation the PH value of fruits and vegetables.
20. Cereals- Effect of soaking time on the quality of dhal and rice Gluten formation in batters and doughs.

Department of Higher Education, Govt. of M.P.  
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Session 2010-2011

Class / कक्षा	: M.Sc. (H.Sc.)
Semester / सेमेस्टर	: III
Subject / विषय	: Food and Nutrition
Title of Subject Group	: Issues related to Women's Health
विषय समूह का शीर्षक	:
Paper No. / प्रश्नपत्र क्रमांक	: IV
Compulsory / अनिवार्य या Optional / वैकल्पिक अनिवार्य	: Compulsory
Max. Marks अधिकतम अंक	: 35

Particulars / विवरण

Unit-1	(A) <b>Women and Work:</b> Environmental stress, Nutrition, Health and gender, living condition, Occupational health, Health facilities.
Unit-2	(A) Current Nutrition and Health Status of Women and Children in India (B) Policies and programmes for promoting maternal and child nutrition
Unit-3	Effect of urbanization on Women. Impact of economic policies, industrialization, and globalization on women.
Unit-4	<b>Policies and Legislations.</b> (A) CEDAW (Conventions on Eliminations of all forms of Discriminations against Women) (B) WRLH ( Women's Right to Life and Health)
Unit-5	<b>Empowerment of women:</b> Role of Education and various National Schemes.

Suggested Readings :

- Census report, Government of India and Govt. of Madhya Pradesh.
- NFHS Reports, Govt. of India.
- UNICEF- States of the worlds children
- International child health; A digest of Current information.
- Textbook of Nutrition and Dietetics, Kumud Khanna
- Nutrition and child care, a practical guide, Shanti Ghosh.
- Diet and ageing, exploring some facts, Dr. Kalyan Bagchi and Seema Puri
- Nutrition in children, developing country concerns, H.P.S. Sachdev, Panna Choudhary
- National profile on women, health and development, Sarla Gopalan, Mira Shiva, Voluntary Health Association of India and WHO.

BARKATULLAH UNIVERSITY, BHOPAL

Class - M.Sc. (Home Science)  
Subject - Food and Nutrition  
Paper Name - Food Science  
Paper - III Practical - II  
Semester - Third

Note : All practicals are compulsory to conduct in the Laboratory/field

Practical - 60 Marks  
Viva - 20 Marks  
Sessional - 20 Marks  
Total - 100 Marks

- Unit-I** 1. Prepare Sol, gel, emulsion and foams with one variation.  
2. Prepare one recipe for each colloidal system and identify its functional property.
- Unit-II** 1. Prepare caramel, Crystallization sugar (fondant, fudge) and syrup from sugar.  
2. Prepare one recipe using each functional property of caramel, pudding/chocolate.
- Unit-III** 1. Make gelatinization of starch and observe the changes.  
2. Prepare one recipe of gelatinization only one by using the pectin.
- Unit-IV** 1. Observe the effect of acid and alkies on vegetables and fruit (prepare one recipe)  
2. Estimate the PH level of vegetable and fruit (at 5 each).
- Unit-V** 1. Observe the effect of soaking time on the quality of dhal/rice/flour (prepare one recipe each)  
2. Prepare breakfast recipe using flaked & puffed cereals and (ii) observe the gluten formation in batters and dough.

Market Survey to study the products available

1. Confectionary shops
2. Breakfast cereals
3. Processed foods-Jam ,jelly



Food & Nutrition  
Semester - IV  
Paper - IV  
Dissertation (Optional C)

M. Marks : 50

**CHAPTER - I**

Introduction.

**CHAPTER - II**

Review of Literature.

**CHAPTER - III**

Methodology.

**CHAPTER - IV**

Analysis and discussion.

**CHAPTER - V**

Conclusion and recommendation.  
BIBLIOGRAPHY.

Department of Higher Education, Govt. of M.P.  
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Session 2010-2011

Class / कक्षा	: M.Sc. (H.Sc.)
Semester / सेमेस्टर	: IV
Subject / विषय	: Food and Nutrition
Title of Subject Group	: Health and Fitness
विषय समूह का शीर्षक	:
Paper No. / प्रश्नपत्र क्रमांक	: I
Compulsory / अनिवार्य या Optional / वैकल्पिक अनिवार्य	: Compulsory
Max. Marks अधिकतम अंक	: 35

Particulars / विवरण

Objectives

- (1) Understand the components of health and fitness and the role of nutrition in these.
- (2) Make nutritional, Dietary and physical recommendations to achieve fitness and well-being.
- (3) 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)  $^{40}\text{K}$  Analysis
- (g) Other methods: Concept

(2) Compositional changes concept

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

	(B) <b>Holistic approach to the management of fitness and health:</b> Nutrition, Exercise, Physical fitness and health inter-relationship (a) Energy input and output (b) Diet and Exercise
Unit-2 BY	(A) Effect of specific nutrients on work performance and physical fitness. Shifts in carbohydrate and at metabolism, mobilization of fat stores during nutrition in sports: Sports specific requirements. Diet manipulation. Pre-game and Post game meals. Water electrolyte losses and their replenishment during exercise and sports events, effects of dehydration, Importance of sports drinks. (B) Diet for persons with high energy requirements stress and starvation.
Unit-3 MS	(a) Nutritional regulation of gene expression. (b) Inborn errors of metabolism: Sickle cell Anaemia, Thallasaemia, Cystinuria, Phenylketonuria, Hereditary Lactose intolerance, crout.
Unit-4 MS	(A) Defining nutrition goals/guidelines appropriate to health, fitness and prevention and management of Chronic degenerative disease diabetes mellitus CV disorders, bone, health and cancer. (B) Non-nutritive food components with potential health effects: Polyphenols, tannis, phytate, phytostrongens. Cyanogenic compounds, lectins and saponins
Unit-5 BY	(A) Nutrition and exercise regimes for pre and post natal fitness. (B) Alternative systems for health and fitness like ayurveda yoga, meditation, vegetarianism and traditional diet. (C) Nutrition Management in special conditions: Space travel, high altitudes, low temperatures submarines.

**Suggested Readings :**

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) Nutrient Interactions. Marcel Dekker Inc. York.
4. World Reviews of Nutrition and Dietetics.
5. WHO Technical Report Series.

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Sesion 2010-2011

Class / कक्षा	: M.Sc. (H.Sc.)
Semester / सेमेस्टर	: IV
Subject / विषय	: Food and Nutrition
Title of Subject Group	: Clinical & Therapeutic Nutrition
विषय समूह का शीर्षक	:
Paper No. / प्रश्नपत्र क्रमांक	: II
Compulsory / अनिवार्य या Optional / वैकल्पिक अनिवार्य	: Compulsory
Max. Marks अधिकतम अंक	: 35

Particulars / विवरण

### Objectives

- (1) Understand the etiology, physiologic and metabolic anomalies of acute and chronic diseases and patient's need.
- (2) Know the effect of various diseases on nutritional requirement and nutritional status.
- (3) Be able to recommend and provide appropriate nutritional care for preventions and treatment of various diseases.
- (4) Orient the students with all the important state of art methodology applied in Nutritional assessment and surveillance of human groups.
- (5) Develop specific skills to apply the most widely used methods

Unit-1 39	(A) Diseases of liver exocrine pancreas and biliary system: Physiology Etiology, Pathogenesis, Symptoms and Management (2) Liver diseases (a) Cirrhosis (b) Viral hepatitis (c) Hepatic coma (d) Wilson's disease (3) Disorder related to gall bladder (a) Cholecystitis (b) Gall stones (4) Disorders related to pancreas (a) Pancreas
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Unit-2

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) Lipo- Proteins 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) Dietary Management
    - ii) Exercise
  - d) Prevention of CHD
- B. Cerebrovascular disorder and nutritional management

Unit-3

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

**Unit-4**

MS

- A. Nutritional care for patient with disease of Kidney**  
Review of physiology and function of normal kidney
1. Nephritis
    - (a) Classification
    - (b) Etiology
    - (c) Characteristics
    - (d) Nutritional care and management
  2. Nephritic syndrome
    - (a) Etiology
    - (b) Characteristics
    - (c) Nutritional care and management
  3. Acute and Chronic renal failure
    - (a) Etiology
    - (b) Types
    - (c) Nutritional care and management

**Unit-5**

JK

**Nutritional care for patients having Surgery and Burns ,Cancer.**

- (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) Oesophagus surgery
    - (f) -
- (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
- D) Latest researches and concepts in management of various life style problems.

Practical :

1. Planning calculation and preparation of diets mentioned in theory.
2. Interpretation of patient data and diagnostic tests and drawing up of patient diet prescription using a case study approach
3. Follow up acceptability of diet prescription, compliance, discharge diet plan,
4. Preparation of diet counseling aids for common disorders.
5. Spotting.

Suggested Readings :

1. Manual of Dietetics Practice -Brony Thomas.
2. Nutrition in Health and Disease - Anderson
3. Normal in 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
7. Nutrition and Diet Therapy - Stanfield
8. Modern Nutrition in Health and Disease Robert S. Good hart
9. Nutritional Principles and Clinical Practices M. Hunt and James
10. Nutrition in Critical Care - Zaroga
11. Fundamentals of Clinical Nutrition 93- Weinster
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13. Nutrition and Dietetics - Shubhangini Joshi
14. Human Nutrition and Dietetics - Davidson Passmore
15. Clinical Dietetics and Nutritional F.P. Anita
16. Textbook of Nutrition and Dietetics - Kumud Khanna Etal
17. Mohan L.K. and (2000) Krause's Food Nutrition Diet Therapy 10th Edition W.B. Saur  
Ltd.

**Practical :**

अधिकतम अंक / Max.Marks :50

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. **Pulses-** Germination sprouting.
3. **Colloidal system of foods-** Formation of Sol, gel emulsion.
4. **Leavening agents-** Use of Leavening agents in cookery. Fermentation and fermented products
5. **Fat and Oils-** melting point and smoking point. Permanent and semi permanent emulsions, fat absorption and its measurement.
6. **Milks and Milk Products:** Scalding of milk, preparation of curd, paneer, khoa, cheese, butter and fermented milk.

**Suggested Readings :**

1. Food Science- Shri Laxmi.
2. Food Science and Principles- SManey.
3. Food Science- Halen Charlies.
4. Food Preparation- Peckham.
5. Food Science- Niemann Potter.
6. Food Science- Mudambi.
7. Introductory food- Bennian Hughes.
8. Food Chemistry- Mayer.
9. Food Processing- Marwaha & Arora.
10. Food Processing and Preservation – Subblaxmi.
11. Biotechnology and Food ingredients- Goldberg.
12. Food Science Manual- Mohini Sethi & Iram Rao.
13. Experimental Cookery – Palmer
14. Experimental Cookery – Belly & Lowe.



Department of Higher Education, Govt. of M.P.  
 Post Graduate Semester wise Syllabus  
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 उच्च शिक्षा विभाग, म.प्र. शासन  
 स्नातकोत्तर कक्षाओं के लिये सेमेस्टर अनुसार पाठ्यक्रम  
 केंद्रीय अध्ययन मण्डल द्वारा अनुशंसित तथा म. प्र. के राज्यपाल द्वारा अनुमोदित  
 Sesion 2010-2011

Class / कक्षा : M.Sc. (H.Sc.)  
 Semester / सेमेस्टर : IV  
 Subject / विषय : Food and Nutrition  
 Title of Subject Group : Food Science & Current Trends  
 विषय समूह का शीर्षक :  
 Paper No. / प्रश्नपत्र क्रमांक : III  
 Compulsory / अनिवार्य या Optional / वैकल्पिक अनिवार्य : Compulsory  
 Max. Marks अधिकतम अंक : 35

Particulars / विवरण

Unit-1 VK	(a) <b>Pulses and Legumes:</b> Classification, composition, denaturation non-enzymatic browning Functional properties of whole pulses and legumes germination and sprouting. (b) <b>Leavened Products:</b> Leavening agents, Biologically leavened and chemically leavened products. Fermentation process and fermented products.
Unit-2 MS	(a) <b>Milk and Milk Products:</b> Composition, Physical and functional properties. Denaturation, effects of processing and storage and Dairy Products: Cultured milk, youghart, butter, whey, cheese, concentrated and dried products, Frozen desserts, dairy product substitute.
Unit-3 BSA	(a) <b>Spices and Condiments:</b> Composition, Flavouring extracts natural and synthetic (b) <b>Eggs:</b> Structure and composition. Changes during storage. Functional properties of eggs, use in cookery. Egg Processing. Low Cholesterol egg substitutes.
Unit-4 VK	(a) <b>Fats, Oils and Related Products:</b> 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>I Meat and Poultry:</b> 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.
Unit-5 MS	<b>II Biotechnology in Food:</b> <ul style="list-style-type: none"> <li>▪ Algae as food spirulina</li> <li>▪ Organic food</li> <li>▪ Nutraceuticals</li> </ul>

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स्नातकोत्तर कक्षाओं के लिये सेमेस्टर अनुसार पाठ्यक्रम

केंद्रीय अध्ययन मण्डल द्वारा अनुशसित तथा म. प्र. के राज्यपाल द्वारा अनुमोदित

Sesion 2010-2011

Class / कक्षा	: M.Sc. (H.Sc.)
Semester / सेमेस्टर	: IV
Subject / विषय	: Food and Nutrition
Title of Subject Group	: Nutrition and Health of Women, Child and Elderly
विषय समूह का शीर्षक	:
Paper No. / प्रश्नपत्र कमांक	: IV
Compulsory / अनिवार्य या Optional / वैकल्पिक	: Optional (A)
Max. Marks अधिकतम अंक	: 35

Particulars / विवरण

Unit-1 MS	<b>Maternal Health</b> (a) Disease pattern and Reproductive health (b) Women-pregnancy and lactation (c) Safe Motherhood (d) Care of at-risk mothers - <i>Search</i> (e) Health seeking behaviour (f) Women and AIDS
Unit-2 B9	<b>Issues related to Child Nutrition</b> (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-3 VK	<b>Issues related to Elderly</b> (a) The ageing process Physiological, biochemical and body composition changes. (b) Theories of ageing
Unit-4 VK	(a) Socio Psychological aspects of ageing especially problems of elderly women (b) Nutritional requirement of elderly and dietary management to meet nutritional needs.

Unit-5 MS	(a) Chronic degenerative diseases and nutritional problems of elderly the etiopathogenesis, management, prevention and control. (b) Policies and programmes of government and NGO sector pertaining to the Elderly.
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**Suggested Readings :**

1. Census report, Government of India and Govt. of Madhya Pradesh.
2. NFHS Reports, Govt. of India.
3. UNICEF- States of the worlds children
4. International child health; A digest of Current information.
5. Textbook of Nutrition and Dietetics, Kumud Khanna
6. Nutrition and child care, a practical guide, Shanti Ghosh.
7. Diet and ageing, exploring some facts, Dr. Kalyan Bagchi and Seema Puri
8. Nutrition in children, developing country concerns, H.P.S. Sachdev, Panna Choudhary
9. National profile on women, health and development, Sarla Gopalan, Mira Shiva, Volunte  
Health Association of India and WHO.

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Session 2010-2011

Class / कक्षा	: M.Sc. (Home Science)
Semester / सेमेस्टर	: IV
Subject / विषय	: Food & Nutrition
Title of Subject Group	: Mass Communication
विषय समूह का शीर्षक	:
Paper No. / प्रश्नपत्र क्रमांक	: IV
Compulsory / अनिवार्य या Optional / वैकल्पिक अनिवार्य	: Optional (B)
Max. Marks अधिकतम अंक	: 35

### Particulars / विवरण

#### Objectives:

- To understand the importance of communication.
- To develop skill for communication ability.
- Importance of audio visual aids in communication.

<b>Unit-1</b>	<ol style="list-style-type: none"><li>1. Concept of communication</li><li>2. Elements and process of communication.</li><li>3. Functions of communication.</li><li>4. Non verbal communication-Sign, Gestures, body movement.</li><li>5. Verbal communication-Language and written communication.</li></ol>
<b>Unit-2</b>	<ol style="list-style-type: none"><li>1. Types of communication - Intra personal, Inter personal, Group communication and Mass communication.</li><li>2. Feed back in communication.</li><li>3. Characteristics and method of feed back.</li><li>4. Elements of effective communication.</li></ol> <p>Barriers to communication</p>
<b>Unit-3</b>	<ol style="list-style-type: none"><li>1. Print Media-Origin, development characteristics of News paper.</li><li>2. News agencies-United news of India (UNI). Press Trust of India (PTI) Reuter, tass and etc.</li><li>3. magazine-Format. Type and organization.</li><li>4. Concept of News, values, sources of News. Structure of News Report.</li><li>5. Features article, Editorial.</li></ol>

<b>Unit-4</b>	<ol style="list-style-type: none"> <li>1. Radio-Origin, development and characteristics of Radio.</li> <li>2. radio as a mass medium.</li> <li>3. Radio news, radio features.</li> <li>4. various types of Interview.</li> <li>5. Folk Media.</li> </ol>
<b>Unit-5</b>	<ol style="list-style-type: none"> <li>1. Television-origin, development and characteristics of television.</li> <li>1. T.V. News.</li> <li>2. Contribution of T.V. in Social development.</li> <li>3. Film-Origin, Development of India film.</li> <li>4. Socio cultural effects of film as mass medium. Censorship, using film for extension</li> </ol>

#### REFERENCES:

1. Denis Macwell - Mass communication theory & Introduction.
2. C.S. Rayudu - Communication
3. K.M. Shrivastava - Radio and T.V. Journalism
4. M.V. Kamath - Professional Journalism
5. डॉ. ओम प्रकाश सिंह - संचार माध्यमों का प्रभाव
6. डॉ. श्रीकांत सिंह - जनसंचार
7. डॉ. वेदप्रताप वैदिक - पत्रकारिता के विविध आयाम
8. डॉ. हरिमोहन - रेडियो एवं दूरदर्शन पत्रकारिता
9. डॉ. अर्जुन तिवारी - आधुनिक पत्रकारिता