

B.R. AMBEDKAR BIHAR UNIVERSITY, MUZAFFARPUR
DIRECTORATE OF DISTANCE EDUCATION

M.Phil. HOME SCIENCE (FOOD AND NUTRITION) Syllabus (Regular Mode)
(Syllabus Effective from the academic year 2014 – 2015 onwards)

Semester I	Title of the Course	Marks			Credits
		IA	UE	Total	
Paper I	Research Methods in Nutrition	20	80	100	4
Paper II	Advances in Foods and Nutrition	20	80	100	4
Paper III	Special Paper:- Food Processing, Quality Control And Food Safety	20	80	100	4

Semester II	Title of the Course	Marks			Credits
		IA	UE	Total	
Paper IV	Special Paper:- Community And Public Health Nutrition	20	80	100	4
Paper V	Special Paper:- Clinical Nutrition	20	80	100	4
Paper VI	Dissertation and VivaVoce Viva Voce 50 marks Dissertation 150 marks			200	8

PAPER – I – Research Methods in Nutrition

Unit-I Types of nutrition research and studies- longitudinal, cross sectional, epidemiological, surveillance, retrospective, in-vivo, in-vitro and experimental. Animal nutrition experiments- principles, selection of animal, comparative feeding trails, design, applications and ethics. Human nutrition experiments- Ethical clearance and consent. Problem selection- factors to be considered. Experimental designs- examples of nutrition research using the following experimental designs: single group, pre and post design, case study, cohort study, ex-post facto study, time series experiments and factorials designs. **Unit-II** Data collection- principles, definition and examples in nutrition and health for the following: 1. Quantitative tools i Direct parameters- Application of anthropometry, dietary survey, clinical, biochemical and growth monitoring tests, body composition tests and physical fitness tests. ii. Indirect parameters – vital statistics, population tests, socio economic indices, KAP surveys.

2. Qualitative research tools

i. Types of interviews

ii. Focus group discussions

iii. Free listing and pile sorting

iv. Narrative

v. Case studies

vi. Participatory methods

3. Integrating qualitative and quantitative methods.

4. Planning and implementation of a nutritional assessment survey.

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UNIT- III Indices and methods to assess the requirement and quality of the following in body and food: proteins, carbohydrates, lipids, energy, vitamins, minerals, trace elements and water. Product development- need, scope and methods. Subjective and objective methods for evaluation of food products- principles, methods and recent trends. Use of food and nutrition software tools- calculation of BMI nutrients.

UNIT- IV Sampling methods, testing hypothesis. Data analysis- uses of the following with example of and health data:

1. Descriptive statistics- mean median, mode and standard deviation percentile, T- test, chi-square test, F-test, correlation and regression.
2. Non- parametric statistics in nutrition research
3. Uncertainties in nutrition and health research- source, measurement (probability) and methods to minimize impact.
4. Organizing the results and report writing.
5. Use of SPSS Package for consolidation and statistical analysis.

UNIT- V Introduction of nutrition and health management- definition, objectives and components of planning, implementation and evaluation. Operations research and contribution to nutrition and health management. Planning, implementation and evaluation of a nutrition project or programme from proposal development to report writing. Critique of research of recent research studies- strengths and weakness, interdisciplinary perspectives.

References

1. **Ghai. O.P, Gupta. P,**(1999), Essential Preventive Medicine- A Clinical And Applied Approach.
2. **Hendrick. T.E, Bickmath and Rog. D.J,** (1993), Applied Research Design- A Practical guide, California, Sage publication, Inc.
3. **Miles M.B, Huberman A.M,** (1994), Qualitative Data Analysis- An Expanded Source Book, 2nd Edition, California, Sage publication, Inc.
4. **Wilson. K, Goulding. K.M,** A Biologist's Guide To Principle And Techniques In Practical Biochemistry.
5. Proceeding of N & I, 1993, No 40
6. **Suitor. C.W, and Crowley. H.F,** Nutrition- Principles And Application In Health Promotion.
7. **Pelleff. C.D and Young. V.R,** Nutritional Evaluation of Protein Foods.
8. **Harrison Clacke,** Application Of Measurements To Health and physical education ,5th edition ,Prentice Hall.
9. **Keith Wilson and John Walker,** Practical Biochemistry- Principles And Techniques.
10. **George. E,** Nutritional Bioavailability Of Zinc.
11. **Earl. B,** (1984), Practice Of Social Research, Wordsworth publishing, California.
12. **David. G.Alms, Basy. H, Katano Witz. Henry. L, Reodiger,** (1995). Research Methods In Psychology, West pulishing company, New York.
13. **Dumm Olive Jean, Virginia. A. Clark,** (1990), Applied Statistics, John Wiley and Sons.
14. **Snedecor. G.W,** (1992), Statistical Methods, The Iowa State University Press, Iowa.
15. **Deldert. C. Miller,** (1991), Handbook Of Research Design And Social Measurement, 5th edition. Sage publication, New Delhi.

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BOOKS FOR REFERENCE

1. Hart shorne, Richard, perspective on the nature of geography, John Murray, London.
2. David Harvey, Explanations in geography Arnold Heinemann.
3. Freeman Hundred years of Geography.
4. Peter Haggett, Geography-A modern synthesis.
5. C.R.I (othari, Research Methodology, methods and techniques.
6. R.P. Misra, Research Methodology, a handbook.

PAPER – II Advances in Foods and Nutrition

UNIT- I Food Science and Application: Nutritional factors and anti nutritional factors and active principles and changes of active principles during cooking and their nutritional implications for the following: cereals, pulses, vegetables and fruits, nuts and oilseeds, milk and milk products, tea, coffee, and cocoa, spices and condiments, meat, fish, poultry and egg, fats and oils Food adjuncts- Applications of natural and synthetic flavours, colors, preservatives. Functional foods- Latest trends in the concept of functional foods; their role in designer foods, nutraceuticals and food analogues and as phytochemicals and antioxidants. Genetically modified foods- potential problems and solutions.

UNIT- II Biochemical Aspects of Macro Nutrients: Carbohydrate: Digestion, absorption and metabolism, effects of deficiency and toxicity. Protein: Digestion, absorption and metabolism, effects of deficiency and toxicity. Protein quality evaluation- methods and application, Amino acids- Essential and non essential amino acids, role of amino acids in health and diseases. Fat: Digestion, absorption and metabolism, types of fatty acids, their role in health and disease. Energy: Energy metabolism- BMR, SDA and energy requirement, respiratory quotient and metabolism in starvation, interrelationship between the nutrients. Fibre –Role of fibre in the body.

UNIT- III Biochemical Aspects Of Micro Nutrients: Vitamins: Function, digestion, absorption and metabolism of fat soluble and water soluble vitamins, effects of deficiency and toxicity, bio assay of fat and water soluble vitamins, interrelationship. Minerals and trace elements, function, absorption and metabolism, effects of deficiency and toxicity, interrelationship. Water and electrolyte balance.

UNIT- IV Nutritional through life cycle RDA and nutritional importance during pregnancy- complications, foetal mal development related to nutrition. Weight management. Teenage pregnancy and its complications. Lactation- special nutritional consideration during lactation. Infancy & childhood years- Pre term infants and nutritional needs- vitamins & minerals needs, protein foods, obesity, changing nutritional needs of preschoolers. Adolescents: Recent rents in growth and development and changing nutritional requirements. Eating disorders and changes in foods habits and their effects. Adults- Nutritional importance for men and women, menstrual abnormalities and complications. Nutritional in post-menopausal women, osteoporosis and diet modification. Nutritional in Aging- Metabolic changes in aging, nutrition in aging process. Nutritional problems in changing society- Psychosocial influences on food habits, food and gender, Religion, moral ethics, cultism and quackery, myths, taboos and superstition, physiological aspects of food choice and demographic choice. Malnutrition in learning situation, global trends and policy approaches. Implications of new approaches for nutrition education. World food problem, food security in global & national level.

UNIT- V Biochemical basis of health and diseases Metabolic alteration in- obesity diabetes, cardiovascular disease, liver disorder, renal disorders, febrile conditions, cancer, AIDS and burns. Nutritional in born error of metabolism, nutrition and immunity, drugs food-nutrient interaction, role of antioxidants in health and disease.

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PAPER - III FOOD PROCESSING, QUALITY CONTROL AND FOOD SAFETY

UNIT I Status of food processing Industry in India: Status, scope, need and major constraints in growth of food processing in India. Production trends of cereals (rice, wheat & corn) pulses turdhal, Bengal gram and green gram) fruits and vegetables and milk and milk products, flesh foods and egg. Food processing; Production of bakery items, breakfast cereals, dhal milling, jams and squashes, milk powder – cost, capacity and supplier of each of the equipment, setting up of pilot plant for bakery and fruit processing unit.

UNIT II Principles of quality control and evaluation General principles of quality control, quality attributes of raw materials, process control and finished product evaluation, subjective and objective methods of evaluation of foods Physico-chemical characteristics of bakery products (bread, biscuits, cookies, and cakes), fruit and vegetable products (jam, squash & puree) milk and milk products (milk powder – toned & skimmed, cheese & ice cream)and pulses. Basic tests for identification of microbial contamination, water activity in processed foods – definition and importance.

UNIT III Food safety and sanitation Food safety, hazards, food toxins, causes and effects, types of food toxicants endogenous naturally occurring and synthetic toxicants. Adulteration and tests to detect adulterants, heavy metal and pesticide contamination, risk assessment for chemical and biological food hazards, sanitation and safety – significance and hygienic management, safety measures adopted in food industry.

UNIT IV Methods to analyse food quality. National food laws and standards- PFA, FPO, BIS, AGMARK, MPO, MMPO, APEDA, MPEDA **International Standards-** FDA, TQM, HACCP, codex alimentarius.

UNIT V Packaging and Labeling Principles and characteristics of packaging materials, labeling and its types codex guidelines, FDA guidelines for nutrition claims, ensuring proper labeling – guiding principles. Recent developments on the food labeling front in India. Food fortification- definition, need, scope, kind of fortification in cereals, fruits, vegetables, milk and milk products.

References

1. Journal of Food science and technology
2. Indian food packer
3. Processed food
4. Food Technology
5. Proceedings of International Food convention
6. Douglas M., Cousidine P.E and Glenn D. Comidine (1997) Food and food production Encyclopedia , CBS Publishers New Delhi
7. Robin M. Philip Convenience foods- Recent technology Boyes Data Corporation, New Jersey, USA.
8. Thomas Richards.m John W.Finley Chemical changes in food during processing –AVI Publication, West Port, Connecticut
9. Lal G.Sidappa, C.E.Tandon, Preservation of fruits and vegetables
10. Norman Desroisier (1970) Technology of preservation, The AVI Publishers Inc

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PAPER - IV COMMUNITY AND PUBLIC HEALTH NUTRITION

UNIT-I Nutrition for the community Nutrition of the individual, family and community - general concept, nutritional problems in changing societies with special reference to nutrient deficiencies- prevalence, causes and remedies. Effects of malnutrition through the life cycle. Assessment of nutritional status - direct and indirect methods. Nutrition for the tribal population.

UNIT-II Nutrition education Definition, planning, conducting and evaluation. Tools of nutrition education- merits and demerits, curriculum designs for nutrition education, nutrition education through health care systems. Formulation of realistic developmental health plans based on needs with special reference to vulnerable group population and women. Healthy nutrition through local produce.

UNIT-III Population and Food availability Size and growth rate of population in India. The food problem and policy. Measures to solve problem. New agricultural strategy. Food security in India - problems and management: estimates of hunger and poverty :food deprivation. Effective food security management. Intra family food distribution, food fads and fallacies. Demography, vital statistics and population control.

UNIT-IV Nutrition Intervention Programmes and Nutritional Health Programmes National- ICDS, Nutritious noon meal scheme, NNMB, PHC, MCH, MNP International - CARE, WHO, FAO, UNICEF. National Health Programmes- NTCP, NFPC, NLMP, MEP, AIDS control programme, National Immunisation Programme and IDDC. National anaemia prophylaxis programme. Vitamin A prophylaxis programme and Goitre control programme.

UNIT-V Health Indices- IMR, MMR and Morbidity rates - Menace of population- hazards of agriculture, water and sanitation, air and health. Epidemiology and control of communicable diseases - definition, etiology, transmission of bacterial, viral, parasitic infections, HIV and Hepatitis. Vaccine preventable diseases.

References

1. Philips Foster and Howaid D. Leathers, (1999), The World Food Problem Tackling the Causes of Under Nutrition in the Third World, second edition. Lynne Rienner Publishers, Inc.
2. World Food Programme Enabling Development Food Assistance In South Asia, Publication Prepared By WFP Regional Office For South Asia.
3. Lillian Langseth, (1996), Nutritional Epidemiology- Possibilities And Limitations, International Life Sciences Institute.
4. Ghai O.P. And Gupta.P,(1999), Essential Preventive Medicine- A Clinical And Applied Orientation, Vikas Publishing House Pvt. Ltd.
5. The State Of Food Insecurity In The World (2000), Food And Agriculture Organizations Of The United Nations, Rome, Italy.
6. National Workshop On Alleviating Micronutrient Deficiency- Role Of Horticulture And Home Gardens - Background Papers Organized By M.S. Swami Nathan Research Foundation, Chennai- 600113, Friday 29, 2001.
7. Food And Nutrition Bulletin,(1997), Supplement- Ending Malnutrition By 2020 An Agenda For Change In The Millennium.
8. National Conference on Opportunities and Challenges For Preventing Micronutrient Malnutrition Through ICDS, (1997), Sep 21-22, 2000. Conference Proceedings.
9. Preventing Micronutrient Malnutrition- A Guide To Food Based Approaches, (1997). A Manual For Policy Makers And Programme Planners Prepared By Food And Agriculture Organizations Of The United Nations And International Life Sciences Institute.
10. Rueldar Datt And Sundaram K.P.M, (1997), India Economy, S. Chand And Company Ltd., Ram Nagar, New Delhi-110055.

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PAPER - V CLINICAL NUTRITION

UNIT-I Assessment of nutritional status of the hospitalized patients, Diet counseling. Role of Dietitian in assessing patients' needs Based on Clinical, Bio clinical, Biophysical and personal data. Current trends in nutritional support: Parenteral and enteral nutrition- Feeding of premature and LBW babies- pre and post-operative diets Incorporation of Novel Therapeutic foods in the exchange lists followed in Hospitals, Periodical nutritional screening of patients

UNIT II Etiopathophysiology, metabolic and clinical aberrations, diagnostic features, complications, prevention and recent advances in the nutritional management of- Weight imbalances, diabetes Mellitus and other metabolic disorders, Cardio-vascular disorders.

UNIT III Etiopathophysiology, metabolic and clinical aberrations, diagnostic features, complications, prevention and recent advances in the nutritional management of - Renal disorder, Cancer, Neurological disorders, Infection & febrile conditions and Respiratory problems.

UNIT IV Gastro intestinal tract disorders-ulcer, constipation, diarrhea, dumping syndrome, irritable bowel syndrome. ulcerative colitis, Hitaus Hernia, Regional Enteritis, Diverticulosis, Malabsorption Syndrome. Liver, gallbladder and pancreatic disorders, Stress & trauma. Nutrition and management in- Musculo skeletal disorders, Immuno deficiency & AIDS disorders.

UNIT V Herbs and medicinal plants - medicinal uses Functional foods: Types & medicinal uses Antioxidants- types role & mechanism of action in scavenging free radicals, role in health & disease Phytochemicals- Occurrence, types & role in health & disease Probiotic & Prebiotic foods for health benefits.

References

1. Bakhru. H.K.(2001) Indian Spices & Condiments As Natural Healers, Jaico Publishing, Mumbai
2. Syed A.A. Sharma S.C (2000) Herbal Cure For Common & Chronic Diseases, Pushtak Mahal , New Delhi
3. Gala. R, Gala,D, Gala.S.(1999), NATURE Cure For Common Diseases, Navneet Publications (India) Ltd., Chennai.
4. Manohar Murali. C. H, (2000), Ayurveda For All, Pustrak Mahal. New Delhi.Pp133-136
5. Nutrition Principals And Applications In Health Promotion By Suitir & Crowley.
6. Food, Nutrition & Dietetics By Krause & Mahan, WB Saunders Co., Philadelpia, 1979.
7. Normal & Therapeutic Nutrition By Corinne H Robinson. Merlyn. R. Lawley. Mac Million Publishers & Co.
8. Maurice Shils, James Olson & Noshe, (1994), Modern Nutrition In Health & Disease 8th Edition, Vol I & II, Lea & Febiger Co, USA.
9. Human Nutrition And Dietetics By Davidson And Passmore. English Language Book Society.1985.
10. Garrow, J.S., James W.P.T., And Rajph,A,(2000), Human Nutrition And Dietetics. 10th Edition, Churchill Livingstone.

Journals

1. Nutrition Update Series.
2. World Review Of Nutrition And Dietetics.
3. Journal Of The American Dietetic Association
4. American Journal Of Clinical Nutrition
5. Nutrition Review.

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