

M.A/M. Sc in Home Science

(Food & Nutrition)

SYLLABUS (2022-24)



P.G. DEPARTMENT OF HOME SCIENCE

SAMBALPUR UNIVERSITY

JYOTI VIHAR

MISSION**M.A/M.Sc in Home Science**

M1	Educate society for generations by providing transformative education with deep disciplinary knowledge and concern for environment
M2	Develop problem solving, leadership and communication skill in student participants to serve the organization of today and tomorrow
M3	Aim for the holistic development of the students by giving them value based ethical education with concern for society
M4	Foster entrepreneurial skills and mindset in the students by giving life-long learning to make the them responsible citizens

Programme Education Objectives (PEO)

PEO1	To understand and appreciate role of Home Science, in the development and well-being of individuals, families and communities.
PEO2	To learn about the sciences and technologies which enhance the quality of life of the people
PEO3	To acquire professional and entrepreneurial skills for economic empowerment of student in particular, and community in general
PEO4	To prepare students to become analytical and innovative in research and extension work

PO-1	Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions
PO-2	Effective Communication: Will be able to speak, read, write and listen clearly in person and through electronic media in English and in one Indian Language
PO-3	Social Interaction (Interpersonal Relation): Elicit views of others, mediate disagreements and prepared to work in team
PO-4	Entrepreneurship Capability: Demonstrate qualities to be prepared to become an entrepreneurship
PO-5	Ethics: Recognize different value systems including your own, understand the moral dimensions and accept responsibility for them
PO-6	Environment and Sustainability: Understand the issues of environmental contexts and sustainable development
PO-7	Life-Long Learning: Acquire the ability to engage in independent and life-long learning in the context of socio-technological changes

COURSE AT A GLANCE**M.A/ M. Sc Home Science (Food & Nutrition) 2022-24**

CourseNo.	Title	Credit Hour	Mark Distribution	Total Mark
1st Semester				
HSC. 411	Research Methodology	4(Theory)	20+80	100
HSC. 412	Statistics & Computer Application	4(Theory)	20+80	100
HSC. 413	Nutritional Biochemistry	4(Theory)	20+80	100
HSC. 414	Infancy and Childhood Development	4(Theory)	20+80	100
HSC. 415	Practical related to all the theory papers	4(Practical)	100	100
Total		20		500
	Entrepreneurship development by dept. of MBA	2		
IInd Semester				
HSC. 421	Basics of Textile	4(Theory)	20+80	100
HSC. 422	Nutrition through lifecycle	4(Theory)	20+80	100
HSC. 423	Theories of Human Development & Family Studies	4(Theory)	20+80	100
HSC. 424	Community Health & Nutrition	4(Theory)	20+80	100
HSC. 425	Practical related to all the theory papers, Review of research papers in referred journals	4(Practical)		100
Total		20		500
	IDC	3		
	MOOC (To be decided as per rule)	3		
IIIrd Semester				
HSC. 511	Therapeutic Nutrition	4(Theory)	20+80	100
HSC. 512	Food Processing	4(Theory)	20+80	100
HSC. 513	Institutional Food Management	4(Theory)	20+80	100
HSC. 514	Concerns in Public Health & Nutrition	4(Theory)	20+80	100
HSC. 515	Practical related to all the theory papers & Dissertation (Writing of Synopsis & Field Work) Presentation through a seminar	4(Practical)		100
	Environmental study and disaster management by Dept. of EVS	2		
Total		20		500
IV Semester				
HSC. 521	Communication & Program Planning for health promotion	4(Theory)	20+80	100
HSC. 522	Concerns in Public Health & Nutrition	4(Theory)	20+80	100
HSC. 523	Advance Food Science & Nutrition	4(Theory)	20+80	100
HSC. 524	Dissertation	4		100
HSC. 525	Seminar & field work / lab work	4		100
Total		20		500

Instruction to Paper Setters

- 60 marks In theory papers questions will be set unit-wise with 2 questions from each unit (total 8 questions) carrying a)15-one or b) 7.5-Two / 5-Three (on either or mode).The students shall answer any one question from each unit. (15X4=60)
- 20 marks must be of MCQ/Fill in the Blanks/One word /True or False(1X20)
- 20 marks of internal (assignment + written examination)

Courses of Studies for them M.A./ M. Sc Home Science(Food Science & M.A/M.Sc in Home Science Nutrition)Examination (Under Course Credit Semester System) Effective from First Semester Examination, 2022-24

DETAILED COURSES OF STUDIES

FIRST SEMESTER

Course No: HSC. 411 Research Methodology(Theory)

4CH

Course Outcomes

CO1	Understand the basic concepts/Principles of Research Methodology
CO2	Analyse the Various Concepts to understand them through case studies.
CO3	Apply the knowledge in understanding the practical problems during research work
CO4	Execute/create the project or field assignment as per the knowledge gained

Objectives:

- 1. To understand the scientific approaches to research methodology.*
- 2. To learn different types of research designs, methods of data collection and importance of scaling technique.*

Expected Outcome:

Gaining knowledge on Research Methodology will enable the students to do research properly in thrust areas of Home Science.

Unit-I: Research Methodology: Meaning, aim & objective of research, significance of Research, Role of Research ,Types of Research, Criteria of a good Research.

Research Problem : defining a research problem, selecting the problem, technique involved in defining a problem. Thrust areas in research in Home Science.

Unit-II: Research Design: Meaning need & feature of a good design. Different types of research design, Steps & characteristics of a good sampling design, Types of sampling design, sampling error, criteria for selecting a sampling design.

Unit-III: Data collection: Collection of primary data through different methods (Observation, Interview, Questionnaire, Schedule, Sociometry, Anthropometry, and other methods), Collection of Secondary data, Selection of appropriate method for data collection. Case study method.

Unit-IV: Measurement & Scaling techniques: Classification of measurement scales, Techniques of developing measurement tools, Scaling, Meaning, scale classification bases, important scaling techniques, Scale construction techniques.

Books Recommended

1. Statistical Methods – S.P.Gupta, Sultan Chand & Sons Publisher- NewDelhi
2. Research Methodology, Methods and Techniques – C.R. Kothari Wiley Eastern Limited –New
3. An Introduction to Statistical Methods – C.B.Gupta & V.Gupta- Vikas Publishing House PVTLtd.
4. Methodology and Techniques of Social Research – P.L.Bandarkar & T.S.Wilkinson – Himalaya Publishing House-Mumbai.
5. Research Methods & Measurements in Behavioural & Social Sciences – G.L.Bhatnagar – Agri. Cole. Publishing Academy, New Delhi.

6. Statistics in Psychology & Education – Henry, E. Garrett, David Healey **M.A./M.Sc in Home Science**
7. Experimental Design in Psychological Research –Edwards
8. The Quality of Life: Valuation in social Research – R. Mukherjee – Sage publications, New Delhi.
9. Fundamentals of Statistics- D.N.Elhance.
10. Statistics in Psychology & Education-Garrett &Word

Course No: HSC- 412 Statistics & Computer Application

4CH

Course Outcomes

CO1	Understand the basic concepts/Principles of Statistics & Computer Application
CO2	To understand the basics of computer and its application.
CO3	Apply the knowledge in understanding the practical problems in using the statistics in Home Science Research
CO4	Execute/create the project or field assignment as per the knowledge gained

Objectives:

1. To learn basic statistical procedures for research.
2. To understand applications of various statistical techniques for analysis and interpretation of data.

Expected Outcome:

Gaining knowledge on Statistics & Computer Application will enable students to do qualitative and quantitative data analysis of their research work.

Unit-I: Classification & tabulation of Data: Meaning, objective and types of classification, formation of discrete And continuous frequency distribution, tabulation of data, parts of a table, General Rule of

tabulation, Types of tables, Diagrammatical and graphical presentation of data: significance, types and limitation of different types of diagrams and graphs used for presentation of data.

Unit-II: Measure of Central tendency: Mean, Median, Mode and their uses with examples and their advantages and disadvantages, Measure of Dispersion: significance and methods used in studying dispersion (range, quartile deviation, mean deviation and standard deviations) with their uses, advantages and disadvantages.

Unit-III: Test of Relationship; Meaning, types and methods used to study correlation (simple Co-efficient of correlation, rank correlation. Testing of Hypothesis; Meaning, basic concept concerning testing of hypothesis, procedure for testing hypothesis, Errors in testing hypothesis.

Unit-IV: Parametric and Non-parametric tests: uses of chi square test, student's' test, and 'z' test in testing hypothesis. Interpretation & Report writing; meaning, technique of interpretation, significance, steps followed, layout of report writing, Types of report and techniques of writing a report, The computer system, important characteristics and application in Research.

Books Recommended

1. Statistical Methods – S.P. Gupta, Sultan Chand & Sons Publisher- NewDelhi
2. Research Methodology, Methods and Techniques – C.R. Kothari Wiley Eastern Limited –New

3. An Introduction to Statistical Methods – C.B.Gupta & V.Gupta- Vikram Singh Home Science Ltd.
4. Methodology and Techniques of Social Research – P.L. Bandarkar & T. S. Wilkinson – Himalaya Publishing House-Mumbai.
5. Research Methods & Measurements in Behavioral & Social Sciences – G. L. Bhatnagar – Agri. Cole. Publishing Academy, New Delhi.
6. Statistics in Psychology & Education –Henry ,E. Gar ett, David Heley and Co.
7. Experimental Design in Psychological Research –Edwards
8. The Quality of Life: Valuation in social Research – R. Mukherjee – Sage publications, New Delhi.
9. Fundamentals of Statistics-D.N. Elhance.
10. Statistics in Psychology & Education-Garrett &Word

Course No: HSC. 413 Nutritional Biochemistry

4CH

Course Outcomes

CO1	Remember and understand the basic concepts/Principles of Nutritional Biochemistry
CO2	Analyse the various concepts to understand the nutritional utilisations
CO3	Apply the knowledge in understanding the practical problems in life.
CO4	Execute/create the project or field assignment as per the knowledge gained

Objectives:

1. To acquire knowledge on metabolic pathways in the human body for regulation of macro and micronutrients.
2. To enrich knowledge in digestion, absorption and utilisation of nutrients

Expected Outcome:

Gaining knowledge on nutritional bio- chemistry will enable the students to understand how the food is being utilised by our body to get energy.

Unit-I: Nutritional Importance of Carbohydrates: definition, classification, structure, & function. Digestion absorption, and Metabolism of carbohydrates, Blood sugar level & equilibrium.

Unit-II: Nutritional Importance of Amino acids& Proteins: Structure & classification of amino acids, structure of protein, & their function. Digestion, absorption transportation and metabolism of Protein (Nitrogen balance, transamination & domination of protein, urea cycle)

Unit-III: Nutritional Importance of Lipids: definition, importance fatty acids, structure, classifications & types of lipids, importance of lipoprotein, Digestion, absorption, transport and Metabolism of lipids.

Unit-IV: Nutritional importance of macro µ nutrients: Functions, absorption and metabolism of vitamin A, vitamin D, Calcium, Iron, Iodine.

Books Recommended:

1. Fundamental of Biochemistry – A.C.Deb, New Central Book agency (P) Ltd,Calcutta).
2. Food, Nutrition & Health- G. Biswal & C. Lenka, Kalyani Publishers, New Delhi.
3. Text Book of Medical Biochemistry –M.N Chaterjee & Rana Shinde, Jaypee Brothers,

Medical Publishers (P) Ltd Bangalore.

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4. Fundamentals of Biochemistry –J.L. Jain, S. Chand & Company Ltd, Ram Nagar, New Delhi.
5. Human Physiology Vol I – C.C. Chaterjee, Medical Allied agency, Mahatma Gandhi Road, Calcutta.
6. Human Nutrition & Dietetics – Davidson & Passmore
7. Lehninger's Principles of Biochemistry-D.L.Nelson & M.M.Cox, Macmillan Worth Publishers.
8. A manual of Laboratory techniques-Raghuramulu, N. Madhavan Nair and K. Kalyan Sundaram – NIN, ICMR.
9. Harpers Biochemistry- R.K. Murray, D.K. Granner, P.A. Mayes, V.W. Rodwell-Mac millan Worth Publishers
10. Text Book of Biochemistry with clinical correlation T.M. Devlin-Wiley Lissinc.

Course No: HSC. 414 Infancy & Childhood Development(Theory)

4CH

Course Outcomes

CO1	Remember and understand the basic concepts/Principles of Infancy & Childhood Development
CO2	Analyse the various concepts to understand them through case studies
CO3	Apply the knowledge in understanding the practical problems of childhood
CO4	Execute/create the project or field assignment as per the knowledge gained

Objectives:

1. To understand how life begins, infancy, baby hood, early childhood & late childhood.
2. To understand the course of development, changes, & adjustment in childhood.

Expected Outcomes:

Students will able to gain knowledge importance & developmental task & other aspects of infants, babyhood, early childhood & late childhood period.

Unit-I: Foundation of the developmental pattern : How life begins, importance of fertilization, condition affecting prenatal development, hazards during the prenatal period.

Unit-II: Physical Development : physical growth cycles, body size, body proportions, bones, development of the nervous system.

Motor Development : principles and sequence of motor development, some common motor skills of childhood, functions of motor skills

Unit-III: Speech Development : pre-speech forms of communication, major tasks in learning to speak, hazards in speech development.

Emotional Development : pattern of emotional development, characteristics of children's emotion, common emotional pattern, hazards in emotional development.

Unit-IV: Social Development : meaning of social development, social expectation, importance of early social experiences, the patter of social development, social development in early childhood & late childhood.

Play development : meaning of play, contribution of play, characteristics of children's play, common play activities of childhood.

Books Recommended

1. Child Development- L.E.Berk Basten-Allyn & Bacon,London.
2. Child Development- E.B.Hurlock.
3. Developmental Psychology-E.B.Harlock.
4. Child Development & personality- P.H.Mussen, J.J. Conger & J.Kagan, A.C.Huston-Harper & Row Publications, NewYork.
5. Human Development- F.P.Rice-Perntice Hall, New Jersey.
6. The Development of Children- M.Cole & S.Cole-Scientific American Books- Freeman & Co, New York.
7. Child Development- An Introduction – J.W. Santrock & S.K.Yussen Iowa WMC. BrownPublishers.
8. Child Development: Infancy through Adolescence-A.Clarke Stewart & S.Friedman, Johnwiley, New York.

Course No: HSC. 415 Practical related to all theory papers

4 CH

Research Methodology

1. Formulation of research proposal.
2. Write a report on observation of an event.
3. Bibliography and reference writing.
4. Preparation of questionnaire and interview schedule.

Statistics and Computer Application

1. Basic knowledge of computer handling.
2. To know about Micro-soft office (M.S Word, M.S Excel, MS. PowerPoint)
3. Formation of discrete and continuous frequency distribution.
4. Classification and tabulation of data.
5. Diagrammatic and graphical presentation of data (Line graph, Histogram, Bar diagram).
6. Computation of average, standard deviation, co-relation, regression, analysis of variance.
7. Statistical test- Chi-square test, t-test and Z-test.

Nutritional Biochemistry (FN).

1. Analysis of carbohydrate of any food material.
2. Analysis of protein of any food material.
3. Analysis of fat of any food material.
4. Analysis of iron of any food material.
5. Analysis of calcium of any food material.

Infancy and Childhood Development (HDFS).

1. Preparation and use of learning materials for pre-school children (Rhymes, Story).
2. Preparation of play materials using clay, paper, fiber, waste material.
3. Assess the nutritional status of infant by using cane score.
4. Assess the nutritional status of pre-school children by using any scale.
5. Assess the nutritional status of school going children by using any scale.

SECOND SEMESTER

Course No: HSC. 421

Basics of Textile**4CH****Course Outcomes**

CO1	Remember and understand the basic concepts/Principles of Basics of Textile
CO2	Analyse the various concepts to understand the classification, manufacturing and finishes applied to different fibres.
CO3	Apply the knowledge in understanding the practical problems faced by people in selecting textile fibres.
CO4	Execute/create the project or field assignment as per the knowledge and skills gained

Objectives:

3. To acquire knowledge on different types of fibers and their properties.

4. To enrich knowledge in different manufacturing and finishing process of textile.

Expected Outcome:

Gaining knowledge on textile will enable the students to understand different aspects of textile and its application.

Unit-I: Fundamentals of textile : classification of fibers, yarn formation techniques- fibers to yarn

Unit-II: Source, manufacturing process and properties of cotton, silk, wool and rayon.

Unit-III: fabric construction : methods and examples of weaving, knitting, felting & bonded fabric construction

Unit-IV: finishing of fabric : different types of chemical and mechanical finishing process.

Printing of fabric: block printing, screen printing, machine screen printing, rotary screen printing, roller printing, duplex printing

Dyeing : classification of dye, different methods of dyeing – yarn dye, stock dye, piece dye, resist dye, discharge dye.

Books Recommended

1. From fibres to fabrics by Elizabeth gale, allman & son, London
2. Textile fibers and their use, sixth edition, oxford & IBH publishing co.
3. Textbook of Clothing Textiles and Laundry (Pb) by Gupta Sushma Et Al, Kalyani Publishers
4. Textiles: Fiber to Fabric (Asia School Family Studies Fashion) by Bernard P. Corbman

Course outcomes

CO1	Remember and understand the basic concepts/Principles of Nutrition through Lifecycle
CO2	Analyse the various concepts to understand them through case studies
CO3	Apply the knowledge in understanding the practical problems faced by the people in different age group.
CO4	Execute/create the project or field assignment as per the knowledge gained

Objectives:

1. To enhance knowledge of students about physiological changes and nutritional requirements during various stages of lifecycle.

2. To understand problems of different age groups and its managements.

Expected Outcome:

Detail knowledge on nutrition across lifespan can be obtained and different nutritional problems can be tackled easily.

Unit-I: Nutrition during Infancy: Growth and Development during Infancy, nutritional requirement during in infancy. Feeding of infants: breast feeding, artificial feeding, weaning and supplementary foods, feeding of premature & low birth weight babies, Nutritional disorder and common ailments in infancy.

Unit-II: Nutrition for Preschool and school going children (1 to 12 years) Importance of nutrition during preschool/school age. Nutritional requirements during preschool/school years, Food requirements during preschool/school age, Nutrition related problems in preschool/school children.

Unit-III: Nutrition for adolescents: physiological changes, Nutritional requirement, Food preferences. Nutritional problems: Obesity, Eating disorders, osteoporosis, Under nutrition. Prevalence of Anemia in adolescence and its management. Nutrition in Adult hood period on the basis of sex & activities

UNIT-IV: Nutrition during special condition : Pregnancy: Physiological changes, weight gain, , food & nutrient requirements during pregnancy, impact of good nutrition on outcome of pregnancy, Complications of pregnancy& their nutritional management. Lactation: Physiology of lactation, impact of nutrition on milk production, food & nutritional requirement during lactation. , Nutrition during old age: physiological changes, nutritional requirements. Problems of old age, Degenerative diseases, Exercise and old age, Drugs and old age.

Books Recommended

- Human Nutrition and Dietetics- Davidson and Passmore
- Preventive and Social Medicine- Park and Park, Banarasidas Bhanot Publishers, Prem nagar, Nagpur Road, Jabalpur.
- Normal and Therapeutic nutrition - C.H.Robinson, Oxford & IBH Publishing Co. Calcutta.
- Public Health and Hygiene- Y.P.Bedi, Atma ram & sons, Kashmere gate, Delhi.
- Text Book of Public Health and Social Medicine- A.N.Ghei, Lakshmi Book Store, New Delhi.
- Nutrition in Preventive Medicine- G.H.Beatin & J.M.Bengea-WHO.
- Combating under Nutrition- Basic Issues & Practical Approaches, C.Gopalan, NFIPublications.
- NFHS Survey I & II- International Institute for Population Studies, Mumbai.
- Introduction to Nutrition throughout the life cycle, SR Williams, RS Worthington, EDSneholinka, P.pipes, JM ress & KL Mahal, Times Mirroe Mosby collegepublication
- Text Book of Human Nutrition- M.S.Bamji, P.N.Rao & V. Reddy- Oxford & IBH

CourseNo:HSC-423

Theories of Human Development & Family Studies

4CH

Course Outcomes

CO1	Remember and understand the basic concepts/Principles of Theories of Human Development & Family Studies
CO2	Analyse the various concepts to understand them through case studies
CO3	Apply the knowledge in understanding the practical problems of childhood
CO4	Execute/create the project or field assignment as per the knowledge gained

Objectives:

3. To understand how life begins, infancy, baby hood, early childhood & late childhood.
4. To understand the course of development, changes, & adjustment in childhood.

Expected Outcomes:

Students will able to gain knowledge importance & developmental task & other aspects of infants, babyhood, early childhood & late childhood period.

Unit-I: Life span perspectives: Stages of life span, Basic concept of development Principles of growth & Development, Developmental task, Methods of studying Human Development (observation, Questionnaire, Interview, case study, & Psychometric methods) Role of heredity & Environment.,

Unit-II: Theories of Human Development; (Freud's psychoanalytic theory, Learning theory of Pavlov, Watson, Skinner, Cognitive development theory of Piaget, Eriksons Psychosocial theory)

Unit-III: Theoretical & conceptual frame work to study family, Theories of Family; developmental, system, conflict and social Exchange Theory

Unit-IV: Family pattern & policies, family life Cycle, Family Life enrichment programme, Ideology of family rights and responsibilities, family life education.

Books Recommended

1. Child Development- L.E.Berk Basten-Allyn & Bacon, London.
2. Child Development- E.B.Hurlock.
3. Developmental Psychology-E.B.Harlock.
4. Child Development & personality- P.H.Mussen, J.J. Conger & J.Kagan, A.C.Huston-Harper & Row Publications, New York.
5. Human Development- F.P.Rice-Perntice Hall, New Jersey.
6. The Development of Children- M.Cole & S.Cole-Scientific American Books- Freeman & Co,
7. Child Development- An Introduction – J.W. Santrock & S.K.Yussen Iowa WMC. Brown Publishers.
8. Child Development: Infancy through Adolescence-A.Clarke Stewart & S.Friedman, John Wiley, New York.
9. Enhancing the Role of the Family as an agent for Social & Economic Development TISS Bombay

10. Family Life Education in India –Perspectives, Challenges and applications, M.A./M.Sc. in Home Science Rawat Publication Jaipur.
11. Family in Transition: Power & Development, J.K.barala& A.Choudhury, Northern BookCenter,
12. Family Dynamics: Social Work Perspectives, A. Khasgiwala, 1993, Anmol, NewDelhi.

Course No: HSC. 424 Community Health & Nutrition

4 CH

Course Outcomes

CO1	Remember and understand the basic concepts/Principles of Community Health & Nutrition
CO2	Analyse the various concepts to understand them through case studies
CO3	Apply the knowledge in understanding the practical problems in the community.
CO4	Execute/create the project or field assignment as per the knowledge gained

Objectives

1. To understand the concept of community health nutrition & be familiar with the national health care delivery system.
2. To understand the economic consequences of malnutrition & to learn about the strategies for improving the nutritional status of communities.

Expected Outcome:

Knowledge in public health nutrition will make student familiar with concept and current concern of public health nutrition & its implication on the quality of life.

Unit I. Public health nutrition. Health – definition, dimensions, determinants, indicators, Community Health Care Delivery System- Public health sector and private sector. Malnutrition- definition, types and causes of malnutrition.

Unit II Assessment of Nutritional Status- Anthropometry Assessment, Dietary Assessment, Clinical Examination, Laboratory & bio-chemical assessment. Vital Health Statistics.

Unit III Approaches/ Strategies for Improving nutrition status and health status of the community: Health based interventions including immunization, provision of safe drinking water/ sanitation, prevention and management of diarrhoeal diseases. Food based interventions including food fortification, dietary diversification, biotechnological approaches, development of food mixtures, food preservation, supplementary feeding programs (ICDS, PDS, AAY, Annapurna scheme)

Unit IV: Measures to combat malnutrition: National nutrition Policy & Program. National & international agencies in combating malnutrition (WHO, FAO, UNICEF, CARE, ICAR, ICMR, NIPCID, NIN, NFI, FNB, NNMB, CFTRI) .

Books Recommended:

1. Gibney M.J., Margetts, B.M., Kearney, J. M. Arab, I., (Eds) (2004) Public Health Nutrition, NS Blackwell Publishing.
2. Gopalan, C. (Ed) (1987) Combating Under nutrition – Basic Issues and Practical Approaches, Nutrition Foundation of India.
3. Kaufman M. (2007) Nutrition in promoting the public health strategies, principles and practice. Jones and Bartlett Publishers.
4. Park, K. (2009) Park’s Textbook of Preventive and Social Medicine, 20th ed. Jabalpur M/s.

5. Nutrition Science – B.Srilakshmi, New Age international (P) Limited, NewDelhi.
6. Food Hygiene & Sanitation – S.Roday- Tata McGraw Hill, NewDelhi.
7. Essentials of Food and nutrition – M.Swaminathan, Vol I &II, The Bangalore Printing & Publishing Co. Ltd (BAPPCO)
8. Gibney M.J., Margetts, B.M., Kearney, J.M., Arab, L. (Eds) (2004) Public Health Nutrition. NS Prochaska, K.L., The Trans theoretical Model of Behavioural Change, Shumaker SA(Eds).
9. Designing health messages: Approaches from Communication Theory and Public Health Practice. Editors: Edward Maibach and Roxanne Louiselle Parrott © 1995 by Sage Publications, Inc.
10. Community Nutrition in Action: An Entrepreneurial Approach. Fourth Edition. Marie A. Boyle and David H. Holben. © 2006 Thomson Wadsworth.

Course No: HSC. 425 Practical related to all theory papers

3 CH

Basics of Textile.

1. Preparing two samples of weaving method.
2. Preparing two samples of knitting method.
3. Preparing two samples of resist dyeing.
4. Preparing a samples of block printing.
5. Preparing a samples of stencil printing.
6. Visit to explore the manufacturing & dyeing process of fabric.

Nutrition though Life Cycle

1. Diet plan for infant.
2. Diet plan for pre-school and school going children.
3. Diet plan for adolescents
4. Diet plan for adulthood (Sedentary, Moderate and heavy worker men and women).
5. Diet plan for pregnant and lactating women.
6. Diet plan for old age.

Community Health & Nutrition

1. Study of health service system.
2. Assessment of nutritional status of any particular age group
3. Visit to any agency related to health and hygiene.
4. Awareness program for improving health condition.

Writing of Term Paper & Seminar

In this paper the candidate shall prepare a Term Paper in consultation with the Supervisor (To be decided by the Teachers council). The candidate shall give a seminar presentation. The evaluation of the term paper shall be made by the Supervisor & Teachers council (50% by the Supervisor and the rest 50% shall be by the Teachers' Council).

1CH

Course outcomes

CO1	Remember and understand the basic concepts/Principles of Therapeutic Nutrition
CO2	Analyse the various concepts to understand them through case studies
CO3	Apply the knowledge in understanding the practical problems of different diseases condition and their diets.
CO4	Execute/create the project or field assignment as per the knowledge gained

Objectives

To understand causative factors & metabolic changes in various diseases disorders.

To understand the effect of various disorders / diseases on nutritional status, nutritional and dietary requirements.

To be able to recommend and provide appropriate nutrition care for prevention and treatment of various disorders.

Expected Outcome:

Knowledge in public health nutrition will make student familiar with concept and current concern of public health nutrition & its implication on the quality of life.

Unit-I: Therapeutic Nutrition: Therapeutic adoption of normal diets (normal, soft & fluid diets) factors

To be considered in planning therapeutic diets, drugs & diet inter-action, special feeding methods, pre & post operative diets, role of dietician, dietary calculation using food exchange lists, high & low calorie diet, high protein, high fat, & low carbohydrate diets.

Unit-II: Therapeutic Diets: Etiology, symptoms, nutritional Problems, nutritional requirements & dietary management of the Followings: Fever & infection (Zika Virus & Ebola), Peptic ulcer, gastritis, (very low residue diet), Jaundice & Viral Hepatitis, cirrhosis of liver, Pancreatitis (High protein, high carbohydrate moderate fat or fat restricted diet), Diseases of kidney (Nephrosis, glomerulonephritis, renal failure, urinary calculi, dialysis) (controlled protein, potassium & sodium diet)

Unit-III: Therapeutic Diets: Etiology, Symptoms, nutritional problems, nutritional requirements & dietary management of the followings: Diabetes mellitus (metabolic disorder), Obesity, cardio vascular disorder-Atherosclerosis (fat controlled diet) Heart disease (sodium restricted diet) Hypertension, Myocardial Infarction, Congestive Heart failure Coronary Bypass Surgery..

Unit IV: Nutrition in Cancer- Risk factors symptoms, general systematic reactions, Nutritional problems in cancer therapy, Nutritional requirements, Dietary management & role of food in prevention of cancer. Nutrition in HIV and AIDS- Current status of HIV & AIDS in India, relation of nutritional status & HIV or AIDS, Opportunistic Infections(OI), Anti Retro Viral Drugs(ARV's), Mother-to- Child transmission & Paediatric Aids care & Nutrition in HIV.

Books Recommended

1. Nutrition and Dietetics – Subhangini A.Joshi – Tata McGraw-Hill Publishing Company Limited, New Delhi
2. Dietetics – B.Srilakshmi – New age international (P) limited New Delhi.
3. Normal and Therapeutic Nutrition- C.H.Robinson, Oxford & IBH publishing Co.Calcutta.

4. Essentials of Food and nutrition – M. Swaminathan, Vol I &II, The ~~Wiley~~ **McGraw-Hill Education Science Publishing Co. Ltd (BAPPCO)**
5. Food, Nutrition & Diet Therapy-L.K.Mahan & Escott. Stump- W.B. SaundersLtd
6. Guidelines for planning Therapeutic diets- C.Lenka, Akinik Publications, NewDelhi
7. Applied Nutrition & Diet Therapy for Nurses- J Davis, K.Sherer-W.B.Saunders.Co
8. Clinical Nutrition. The Nutrition Society Textbook Series. Blackwell Publishing Company
Garrow, J.S., James, W.P.T. and Ralph, A.(2000)
9. Kaufman M. (2007) Nutrition in promoting the public health strategies, principles and practice. Jones and Bartlett Publishers.
10. Park, K. (2009) Park's Textbook of Preventive and Social Medicine, 20th ed. Jabalpur M/s. Banarsidas Bhanot.

Course No:HSC512: Food Processing

4CH

Course Outcomes

CO1	Remember and understand the basic concepts/Principles of Food Processing
CO2	Analyse the various concepts on food composition and its physicochemical, nutritional and sensory aspects.
CO3	Apply the knowledge in understanding the practical problems in food processing.
CO4	Execute/create the project or field assignment as per the knowledge gained

Objectives

To impart systematic knowledge of basic and applied aspects in food processing & to enable the student to understand food composition and its physiochemical, nutritional and sensory aspects. To gain in depth knowledge about processing and preservation techniques of different food products.

Expected Outcome:

Course on food processing enrich knowledge of students on food preservation & food processing technologies of different food products & keep them to start different food processing units.

UNIT I: Cereal and cereal products technology: Cereals- Wheat, rice, maize, barely, oat, rye- Structure, cultivation, harvesting, properties, composition and commercial value. Milling process- Complete milling process, milled products and their nutritive value and applications. Baking technology- Bread, biscuits/ Cookies and cake, Principles of baking, Ingredients and their functions, methods of preparation, methods of leavening: physical, biological and chemical, scoring of quality parameters.

UNIT II: Meat, fish, egg and its products technology : Meat- Composition, variety, handling, grading, ageing, curing, smoking and tenderizing of meat, meat pigments and colour changes, cooking, storage, methods of preservation for value addition and spoilage. Eggs- Composition, quality factors, storage, bacterial infection and pasteurization, freezing, drying and egg substitutes. Fish- Composition, onboard handling & preservation, drying and dehydration, salt curing, smoking, marinades, fermented products, canning, Modified Atmosphere Packaging, and quality factors.

Unit III: Milk and milk products technology: Milk- composition, factors affecting milk quality, physical and chemical properties. Milk processing: Separation, centrifugal process, natural creaming,

pasteurization, sterilization, homogenization, effect of processing on nutritive value of Milk, Milk powder, Chhna, butter, butter oil, margarine, cheese, ice cream- Commercial processing, BIS Standards, packaging and distribution.

Unit IV: Fruits and vegetable technology: Principles of fruits and vegetables preservation, Processing technologies- Freezing, dehydration/ during, canning, preserves: jam, jelly, marmalade, pickel, sauce, squash, chatni.

RECOMMENDED READINGS

1. Siddapa, G S (1986) Preservation of Fruits and Vegetables, ICAR Publication Van Loesecke HW (1998),
2. Food Technology Series Drying and Dehydration of foods. Allie Scientific Publishers.
3. Salikhe D K and Kadam S S (1995), Handbook of fruit science and technology.
4. Production Composition, Storage and processing. Marcel Decker inc, New York.
5. Marriott N G (1985), Principles of Food Sanitation 1st Edition. A VI publication USA. De Su Kumar, Milk and milk product technology.
6. National Dairy Development Board, Amul, Milk and milk products processing. FPO 1955
7. Fabriani, G and Lintas C. (1988) Durum Wheat Chemistry and Technology. American Association of Cereal Chemistry Inc.
8. Kent N L. (1993) Technology of Cereals. 4th Edi. Pergamon Press.
9. Olson, V M; Shemwell G A and Pasch, S (1998) Egg and Poultry Meat Processing, VCH P, New York
10. Winton & Winton, (1991) Techniques of Food Analysis. Allied Scientific Publishers.

Course No: HSC. 513 Institutional Food Management

4CH

Course Outcomes

CO1	Remember and understand the basic concepts/Principles Institutional Food Management
CO2	Analyse the various concepts and skills for institutional food management.
CO3	Apply the knowledge in understanding the practical experience in managing food material for food service management.
CO4	Execute/create the project or field assignment as per the knowledge gained

Objectives

1. To develop a knowledge base about the different types of Food service units and its evolution
2. To provide practical experience in managing food material for food service management.

Expected Outcomes

Gaining Knowledge on Institutional food management will help the students to develop entrepreneurship in food service & enable them to become good managers.

Unit-I: Institutional Food Management: Development of Food service Institutions, Approaches to Management, Principles of management, functions of management, (Planning, organizing, directing, coordinating, controlling and evaluating) Management Process: Tools of Management, Management of resources, (money, space, materials’ equipments, staff, time, energy and procedures).

Unit-II: Space Planning & Organizing: Kitchen spaces; Types of Kitchen, Kitchen plan, work simplification in kitchen, Designing and layout of kitchens. Storage space: Types of storage, planning & Layout of storage space, sanitation & safety, Service area planning and decoration of service areas.

Unit-III:Food Management: Characteristic , types & quality of foods, Food purchasing, Receiving and Storage of foods, Menu planning, Food production and processing. Effect of preparation and cooking methods, Large Quantity cooking techniques, Food Service: Style of Service & Types of Service. Environmental hygiene and sanitation, Waste disposal, Food handling practices, Personal hygiene Safety and security, Legal responsibilities of a food service institution, Food Standards.

Unit-IV: Financial Management: Definition & Scope of application of Management accounting, Cost concept, Components of costs, Cost control, Pricing, Book keeping & accounting, Personnel Management: Recruitment, Selection, induction, employee facilities & benefits, Types of employee welfare Schemes, training and development of employees.

Books Recommended

1. Catering Management – an integrated approach- M.Sethi & S.Malhon, Wiley Easter Limited.
2. Institutional food Management- Mohini Sethi, New Age International Publishers, Newdelhi
3. Food Service in Institution-West wood harger & Shugarl.
4. Catering Management in the Technological age-Fuller Barrievd- Rock hiff Publications.
5. Personal Management in the Hotel& Catering Industries- Boella- Hutchinson Publications.
6. Food Service Systems & Administration- Hitchcock Macmillan Publication.
7. Hotel House Keeping Training Manual- Andrews Snoher-Tata McGraw Hill Publication- New Delhi.
8. The Practice of Hospitality Management _vol I and II –R.Lewis, T.Begg’s M. Shaw & S. Croffot-AVI Publishing Co. D C. West Port Connecticut.
9. Hospitality & Catering- Ursula Jones & Newtons.
10. Quantity food production planning & Management-Knight J B & Kotschevar LH.3rd Edition John Willey & Sons.

Course No: HSC 514: Concerns in Public Health & Nutrition

4CH

Course Outcomes

CO1	Remember and understand the basic concepts/Principles Concerns in Public Health & Nutrition
CO2	Analyse the various concepts to understand them through case studies
CO3	Apply the knowledge in understanding the practical problems
CO4	Execute/create the project or field assignment as per the knowledge gained

Objectives

- 1.To impart to the students awareness of the magnitude of nutritional problems and agencies working for their amelioration*
- 2.To provide understanding of Nutrition education, National nutrition programmes, objectives and functions of national and international agencies working in the field of nutrition*
- 3.To develop understanding of the methods of assessment of nutritional status and the concept of food security*

Expected Outcomes

- 1.To Understand about infection- its sources, prevention and control*
- 2. Be aware of objectives and functions of national and international agencies working in the field of nutrition*

Unit I : Public Health Aspects of Under Nutrition : Etiology, public health implications, prevention and community based management of PEM and micronutrient deficiencies of public health significance (Vit-A, Vit-D, Calcium, Iron, Iodine, Zinc, Cobalt, Magnesium, Potassium, Sodium).

Unit II : Basics of IYCF Feeding of Low Birth Weight Babies, Kangaroo Mother care and Feeding Options for HIV Positive Mothers Dummy Practice – Problem Oriented Approach IYCF Counseling.

Unit III : Severe Acute Malnutrition - Severe acute malnutrition and its causes, Screening for SAM in the community, Recognise signs of SAM , Recommended criteria of SAM in children (6-59 months) of age, Criteria for hospitalization/in-patient care/NRC, Physiological changes occur in SAM children, Inpatient therapeutic care for children 6-59 months with SAM, Discharge criteria of SAM, Management of SAM in infants < 6 months of age: Management of SAM in HIV infected children.

Unit IV : Public Health Aspects of life style related disorders: Public health implications and preventive strategies for obesity, hypertension, coronary heart disease, diabetes, osteoporosis, cancer, dental caries, Polycystic Ovarian Syndrome.

Books Recommended:

1. Berg, A. (1973) The Nutrition Factor, The Brookings Institution, Washington.
2. Bonita R, Beaglehole R, Kjellstrom (2006) Basic Epidemiology. Second Edition. WHO.
3. Frank G.C. (2008) Community Nutrition-Applying epidemiology to contemporary practice. Second Edition. Jones and Bartlett Publishers.
1. Gibney M.J., Margetts, B.M., Kearney, J. M. Arab, I., (Eds) (2004) Public Health Nutrition, NS Blackwell Publishing.
2. National Consensus Workshop on Management of SAM children through Medical Nutrition Therapy (2009)-Compendium of Scientific Publications Volume I and II. Jointly organized by AIIMS, Sitaram Bhartia Institute of Science and Research, IAP (Subspeciality chapter on Nutrition), New Delhi. Sponsored by DBT.
3. Textbook of Preventive and Social Medicine, Park, K. Park's 20th ed. Jabalpur M/s. Banarsidas.
4. Nutrition Science – B.Srilakshmi, New Age international (P) Limited, New Delhi.
5. Food Hygiene & Sanitation – S.Roday- Tata McGraw Hill, New Delhi.
6. Essentials of Food and nutrition – M.Swaminathan, Vol I & II, The Bangalore Printing & Publishing Co. Ltd (BAPPCO).
7. Nutrition & Dietetics- Subhangini Joshi, McGraw Hill Education (India) Pvt.Ltd.

Course No: HSC. 515 Practical related to all the theory papers Dissertation (Writing of Synopsis & Field Work) Presentation through a seminar 4CH

Therapeutic Nutrition

1. Formulation of food exchanges.
2. Diet plan for typhoid patients.
3. Diet plan for Jaundice patients.
4. Diet plan for peptic ulcer patients.
5. Diet plan for diabetes mellitus patients.
6. Diet plan for Nephritis patients.
7. Diet plan for atherosclerosis patients.
8. Diet plan for hypertension patient
9. Diet plan for obese person.
10. Diet plan for anemic person.

Food processing

1. Preparation of bakery products (cake, cookies, bread etc.)
2. Preparation of fermented food product.
3. Preparation of milk product (khoa, ghee, chenna, butter, ice- cream etc.)
4. Preparation of fruit & vegetable preserved product (jam, jelly, pickle, sauce, squash, dehydration, freezing etc.)

Institutional Food Management (FN).

1. Layout of different type of kitchen.
2. Preparation of different type of menu card.
3. Planning and decoration of service areas (Tea part, High tea party, Buffet party etc.).
4. Book keeping.

Dissertation

(Writing of Synopsis, collection of literature, Preparation of research tool & plan for Field Work/ experimental work& Presentation through a seminar)

Each student has to submit a research proposal to carry out independent research on a topic decided in consultation with the supervisor, (nominated by the teacher's council of the department) to the head of the department in the beginning of the Third semester. The candidate has to write the synopsis of the work to be carried out, prepare appropriate tool for collection/ generation of data, and plan for the field work/ experimental work and make a presentation of this in the department before the faculty and research students for evaluation by the supervisor (50%) and teachers' council of the department (50%). The feedback and comments received during the seminar presentation shall be suitably incorporated in the work under the advice of the supervisor.

FOURTH SEMISTER**Course No: HSC. 521 Communication and Program Planning For Health Promotion4CH****Course Outcomes**

CO1	Remember and understand the basic concepts/Principles Communication And Program Planning For Health Promotion
CO2	Analyse the various concepts to understand the health promotion laid down by the Government .
CO3	Apply the knowledge in developing different programs for the communities.
CO4	Execute/create the project or field assignment as per the knowledge gained

Objectives

1. To be familiar with the national/international dietary guidelines addressing nutrition and health aspects & to learn about the determinants of food behaviour. able to plan, implement and evaluate behaviour change communication for promotion of nutrition and health among the vulnerable groups.
2. To understand the concept of nutrition monitoring and nutrition surveillance & to understand the nutritional problems during emergencies / disasters as well as the strategies to tackle them.

Expected Outcomes

Knowledge on program planning in public health nutrition will help students in understanding dietary guidelines, behavior change communication for nutrition and health promotion and different nutrition policy and programs, monitor and evaluate nutrition surveillance program and strategies to undertake to tackle nutritional problems during emergencies.

Unit I – Communication for health promotion :- concept, definition, meaning of communication, communication process, types of communication. Health communication :- function of health communication, health education, health education and behavior, health care providers.

Unit II- health education:- meaning , definition, principles of health education, approaches to health education (regulatory approach, service approach, primary health care approach), models of health education (medical, motivational, social & interventional model)

Unit-III: Programme planning: meaning, nature, principles & scope of programme planning, principles of programme planning applied to extension, objectives, steps for making a programme, , Programme implementation :aspects of execution, facts responsible for the successful conduct of a programme, role of officials, non-officials and agencies in programme implementation. Evaluation: meaning, scope & purpose of evaluation, elements of evaluation process, uses of evaluation, steps involved, types of evaluation, criteria for evaluation, tools in evaluation

Unit IV: Nutrition in Emergencies and Disasters: Natural and manmade disasters resulting in emergency situations. Nutritional problems in emergencies in vulnerable groups (Macro and micronutrient deficiencies, Infection). Nutritional relief and rehabilitation –food distribution strategy, mass and supplementary feeding, sanitation and hygiene, Public nutrition approach to tackle nutritional problems in emergencies.

Books Recommended:

- Preventive and social medicine by K. Park
- Edelstein S. (2006) Nutrition in Public Health. A handbook for developing programmes and services. Second Edition. Jones and Bartlett Publishers.
- Goyet, Fish. V. Seaman, J. and Geijer, U. (1978) The Management of Nutritional Emergencies in Large Populations, World Health Organization, Geneva.
- Gibney M.J., Margetts, B.M., Kearney, J. M. Arab, I., (Eds) (2004) Public Health Nutrition, NS Blackwell Publishing.
- Owen. A. Y. and Frankle, R. T. (1986) Nutrition in the Community. The Art of Delivering Services, 2nd ed. Times Mirror/Mosby.
- Food processing and Preservation – G. Subhalakshmi & Shobha A. Udipi, New Age International (P) Limited, NewDelhi.
- Food Hygiene & Sanitation – S. Roday- Tata McGraw Hill, New Delhi.
- Public Health Communication: Evidence for Behavior Change by Robert C. Hornik © 2002 by Lawrence Erlbaum Associates, Inc.
- Communication and Health: Systems and Applications. Edited by Eileen Berlin Ray and LewisDonohew© 1990 by Lawrence Erlbaum Associates, Inc.
- Designing health messages: Approaches from Communication Theory and Public Health Practice. Editors: Edward Maibach and Roxanne Louiselle Parrott © 1995 by Sage Publications, Inc.
- Community Nutrition in Action: An Entrepreneurial Approach. Fourth Edition. Marie A. Boyle and David H. Holben. © 2006 ThomsonWadsworth.

Course No:HSC.522**Food Microbiology and Food Safety****4CH****Course Outcomes**

CO1	Remember and understand the basic concepts/Principles Food Microbiology and Food Safety
CO2	Analyse the various concepts to understand the food safety measures.
CO3	Apply the knowledge in understanding the practical problems
CO4	Execute/create the project or field assignment as per the knowledge gained

Objectives

- To understand the nature of microorganisms involved in food spoilage, food infections and intoxications.
- To understand criteria for microbiological safety in various foods operations to avoid public health hazards due to food contamination.

Expected Outcome:

Knowledge on food microbiology and food safety will help students to know role of microorganisms in human welfare and quality control of food.

UNIT I: Overview of Basic Microbiology: Definition, Scope of Food Microbiology, Important Microorganisms in food microbiology: Bacteria, Fungi, Yeast, Viruses, Factors affecting the growth of microbes. Important food borne infections and intoxications due to bacteria, moulds, viruses.

UNIT II: Food Spoilage and Preservation: Food spoilage: Definition, sources of contamination and microorganisms involved in spoilages of various foods: Milk, Bread, Canned food, Vegetables and fruits, Fruit juices, Meat, Eggs and Fish. Physical and chemical means used in destruction of microbes: Definition of sterilization and disinfection, role of heat, filtration and radiation in sterilization, use of chemical agents-alcohol, halogens and detergents.

UNIT III: Microorganisms in Human Welfare: Importance of microbes in food biotechnology: genetically engineered organisms, probiotics and single cell proteins. Nutraceuticals, Dairy products (cheese and yoghurt) and traditional Indian fermented foods and their health benefits.

UNIT IV: Food safety and Quality Control: Public health hazards due to microbial contamination of

foods: (Salmonella typhi, Helicobacter pylori, Campylobacter jejuni, Yersinia enterocolitica, Bacillus cereus, Staphylococcus aureus, Clostridium botulinum, Escherichia coli, Mycotoxins, Hepatitis A virus & Rota virus)- Symptoms, mode of transmission and methods of prevention. Assessing the quality of food by sensory evaluation-subjective evaluation & objective evaluation. Various organizations dealing with inspection, traceability and authentication, certification and quality assurance (PFA, FPO, MMPO, MPO, AGMARK, BIS) ,evaluation of food safety: control of food quality.(codex Alimentarius, Indian standards).

Books Recommended:

1. Food Microbiology – M.R.Adams & M.O.Moss, New Age International (P) Limited, New Delhi.
2. Food Facts and Principles -N. Shakuntala Manay & M. Shadaksharaswamy, New Age International (P) Limited, New Delhi.
3. Food Science – B. Srilakshmi, New Age international (P) Limited, New Delhi.
4. Food Microbiology – William C. Frazier, Tata McGraw Hill publishing Company limited, New Delhi.
5. Food processing and Preservation – G. Subhalakshmi & Shobha A. Udipi, New Age International (P) Limited, New Delhi.
6. Food Hygiene & Sanitation – S. Roday- Tata McGraw Hill, New Delhi.
7. Frazier WC, Westoff DC.(1998)Food Microbiology. 4th ed. Tata Mc GrawHill Publishing Co. Ltd.
8. Garbutt John (1997) Essentials of Food Microbiology. Arnold London.
9. Jay JM, Loessner DA, Martin J.(2005) Modern Food Microbiology. 7th ed. Springer Prescott LM, Harley JP, Klein DA. (2008) Microbiology. 6th ed. WMC Brown Publishers.

CourseNo:HSC-523 Advance Food Science&Nutrition

4CH

Course Outcomes

CO1	Remember and understand the basic concepts/Principles of Advance Food Science & Nutrition
CO2	Analyse the various concepts to understand science of food.
CO3	Apply the knowledge in understanding the practical problems.
CO4	Execute/create the project or field assignment as per the knowledge gained

Objectives:

1. To gain knowledge on importance of and new trends in foods.
2. To understand scientific approaches of RDA and BMR and to learn macro and micro nutrient requirements and their effect on human health.

Expected Outcome:

Improve knowledge on advance food and nutrition will help students to plan balanced diet using food groups and help them to know new trends in food science and nutrition

Unit-I: Food science: Five basic food groups and their contribution to health , Balanced diet. Food preparation: Cooking-objectives, preliminary preparation &, methods of cooking, microwave cooking & changes in nutrient during cooking., Meal planning: objectives, factors affecting meal planning, Food additives, Food adulteration.

Unit-II: Study of different foods & food products: Cereals & cereal products, pulses, Fruits& Vegetables, Nut& oils seeds, Milk and milk products, Eggs, Meat, Poultry, Fish and other Flesh products, Fats & oils , Sugar & Confectionary, Condiments and spices. Food fortification, Functional foods, Antioxidants, Need for convenience foods, New trends in Foods.

Unit-III: Nutrition Science: Definitions, Recommended dietary Allowances-Factors affecting RDA, General principles of deriving RDA, Determination of RDA of different nutrients, Requirements and practical applications of RDA, Energy balance-Units, Direct & Indirect Calorimetry, Determination of energy value of food, Relation between oxygen required and calorimeter value. Total Energy

Requirement. Basal Metabolic Rate(BMR):Measurement of Basal Metabolism-Direct/Indirect calorimetry, Resting energy expenditure, Factors effecting Physical activity, Factors affecting Basal metabolic Rate, Factors Affecting the Thermic Effect of Food.

Unit IV: Nutritional Requirements: Macro nutrients(Carbohydrates, Protein ,Fat) and Micro nutrients(Vitamins & Minerals)-their classification, function, sources, recommended dietary allowances and effect of deficiency, Importance of water and roughage in diet. . Water & electrolytes balance. Emerging Concepts in Human Nutrition, Ongoing nutrition transition and its implications. Changing trends in life style patterns in population groups and their implications.

Books Recommended

1. Normal and Therapeutic Nutrition – C.H. Robinson, Oxford & IBH Publishing Co. Calcutta.
2. Essentials of Food and Nutrition – M. Swaminathan, vol. I &II, The Bangalore printing and Publishing Co. Ltd.
3. Human Nutrition and Dietetics – Davidson, Passmore, East wood, English Language Book Society (ELBS).
4. Nutrition and Dietetics – S.A. Joshi; Tata Mc Graw-Hill Publishing Company Limited, New Delhi.
5. Dietetics – B. Srilakshmi; New age International (P) Limited, New Delhi.
6. Nutrient Requirements and Recommended Dietary Allowances for Indians – Indian Council of Medical Research, National Institute of Nutrition, Hyderabad.
7. Text Book of Human Nutrition – Mahtab. S. Bamji; N. Pralhad rao & Vinodini Reddy, Oxford & IBH Publishing Co. Pvt.Ltd.
8. Nutrition Science-B.Srilakshmi, New Age InternationalPublication-2012.
9. Food Science and Nutrition-Sunetra Roday-Oxford UniversityPress-2016.
11. A Textbook of Food Nutrition & Dietetics- Rehana Begum Sterling publications Pvt Ltd-2015

Course No: HSC. 524 &525 Dissertation, Seminar & field work/ lab work 8CH

Each student has to carry out the dissertation work immediately after registration in the Third Semester and submit the final dissertation containing Introduction, Literature review, objectives, Hypothesis, Methodology, Result & discussion, summary, conclusion, recommendation references etc for evaluation by one internal & one external examiner in the end of Fourth Semester. Appropriate field work/lab work will be done for the dissertation. The candidate has to submit two hard copies and a soft copy of the final dissertation to the head of the department. The H.O.D will invite the examiner for evaluation. The valuation of dissertation shall be followed by an open Viva voce. In the final dissertation evaluation (8CH), 50% weight age shall be given to continuous evaluation during the dissertation work, 25% to the evaluation of content and rest 25% to seminar presentation & viva voce by the examiner.

IDC :- HOME SCIENCE

Unit – I :- food and nutrition

classification of nutrients, introduction, function, sources, deficiency, requirement (RDA) of different nutrients. Basic five food groups. Food preservation :- reasons of food spoilage, methods of food preservation (Bacteriostatic , bactericidal)

Unit – II :- FRM and textile

FRM :- Definition of management , types & characteristics of resources, Money Management :- Definition, Money Management :- methods of money management, Ernst engel's law of consumption. Time & energy management :- work simplification and its techniques, Mundal's classes of change.

Colour:- primary, secondary, tertiary colour, Prang's colour wheel, colour schemes :- analogous, complimentary, split-complimentary.

Textile :- classification of fiber: natural & manmade, fabric construction methods : weaving, knitting, felting, bonding.

Unit – III :- HDFS, Extension & communication

HDFS :- Principles of child development, stages of prenatal development : zygote, embryo, fetus. Stages of postnatal development : birth to old age. Types of family and marriage.

Extension :- Definition, objective & principles of Extension.

Communication:- Definition, elements and types Communication, models of Communication :- Aristotle, Leagan, Berlo, Westley & Machean.

Books Recommended:

1. Child Development- E.B.Hurlock.
2. Textbook of Clothing Textiles and Laundry (Pb) by Gupta Sushma Et Al, Kalyani Publishers
3. Textiles: Fiber to Fabric (Asia School Family Studies Fashion) by Bernard P. Corbman
4. Human Nutrition and Dietetics- Davidson and Passmore
5. Park, K. (2009) Park's Textbook of Preventive and Social Medicine, 20th ed. Jabalpur M/s. Banarsidas Bhanot.
6. Nutrition Science – B. Srilakshmi, New Age international (P) Limited, New Delhi.
7. Management In Family Living by by NICKELL P
8. Education And Communication For Development by by DAHAMA O.P

N.B. – Practical will be selected for each semester from the syllabus as per the teacher's council.