M.A/M.Sc in Home Science

(Food & Nutrition)

SYLLABUS (2024-26)

P.G. DEPARTMENT OF HOME SCIENCE

SAMBALPUR UNIVERSITY

JYOTI VIHAR

Mission

M1	To educate and empower the society for generations by providing transformative education with deep disciplinary knowledge.
M2	To develop problem solving, leadership and communication skills among the students to serve organisations of today and tomorrow.
M3	To have holistic development of the students by giving them value based ethical education.
M4	To foster entrepreneurial skills among the students by giving life- long learning to make them responsible citizen.

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 lifeof 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

Programme Outcomes (PO)

PO1	**Environment and sustainability**: Critically evaluate impact of household and industrial practices on environment. Appreciate use of sustainable practices for improved physical, emotional, social, psychological environment at micro/macro level.
PO2	**Home Science and Society**: Apply technical skills and competencies to diagnose, analyze and address family and societal issues to improve quality of life as a whole, with a special emphasis to marginalized and vulnerable section of society.
PO3	**Communication**- Use of soft skills for clear, contextual, accurate, meaningful, unambiguous effective communication using verbal and nonverbal skills at inter/ intra personal and professional level.
PO4	**Ethics and Integrity**- Apply ethical practices while data collection, conducting experiments, involving human beings as well as animals, delivering professional capabilities. And reporting.
PO5	**Planning Skills**: Apply skills in designing, implementing, monitoring and evaluating programmes effectively for individuals, family, community.
PO6	**Leadership Skills**: Apply democratic leadership skills, inspiring, taking responsibility, delegating tasks while working in a team, communicating with other teams, providing guidance to lesser skilled in various settings, be it family, industry or institutions, or carrying out research projects.
PO7	**Practical Work**- Provides opportunity to students to get acquainted with innovative research projects and develop skills to plan and undertake intervention projects.
PO8	**Life Long Learning**- Ability to reason out, learn and improve oneself in the changing dynamic scenario by strengthening the strength and weakening of weakness for sustainable developmental needs, technological changes, career requirements and new avenues.

Courses of Studies for the M.A/ M.Sc Home Science (Food & Nutrition) Examination(Under Course Credit Semester System)Effective from First Semester Examination, 2024-26

CourseNo.	Title	Credit Hour	Mark Distribution	Total Mark
1st Semester				
HSC. 411	ResearchMethodology	4(Theory)	20+80	100
HSC. 412	Statistics&ComputerApplication	4(Theory)	20+80	100
HSC. 413	Nutrition throughlifecycle	4(Theory)	20+80	100
HSC. 414	Infancy and Childhood Development	4(Theory)	20+80	100
HSC. 415	Practical related to all theorypapers Dissertation – Topic selection & review of research paper	4(Practical)	100	100
Total		**20**		**500**
	Environmental study and disaster management by Dept of EVS	**2**		
II ndSemester				
HSC. 421	Basics of Textile	4(Theory)	20+80	100
HSC. 422	Human Physiology & TherapeuticNutrition	4(Theory)	20+80	100
HSC. 423	Theories of Human Development & Family Studies	4(Theory)	20+80	100
HSC. 424	CommunityHealth &Nutrition	4(Theory)	20+80	100
HSC. 425	Practical related to all theorypapers, Dissertation – Writing of Synopsis	4(Practical)		100
Total		**20**		**500**
	IDC	**3**	**40+60**	**100**
	MOOC (To be decided as per rule)	**3**	**25+75**	**100**
IIIrdSemester				
HSC. 511	Nutritional Biochemistry	4(Theory)	20+80	100
HSC. 512	FoodProcessing	4(Theory)	20+80	100
HSC. 513	FoodAnalysis & Food Quality Control	4(Theory)	20+80	100
HSC. 514	Food Microbiology &Food safety	4(Theory)	20+80	100
HSC. 515	Practical related to all theorypapers Dissertation – lab workor FieldWork, Presentation through a seminar	4(Practical)		100
	Entrepreneurship Development by Dept of MBA	**2**		
Total		**20**		**500**
IV Semester				
HSC. 521	Institutional Food Management	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 -Analysis & interpretation, Presentation through a seminar	4		100
HSC. 525	Dissertation	4		100
Total		**20**		**500**

Instruction to Paper Setters

1. In theory papers questions will be set unit-wise with 2 questions from each unit (total 8 questions).The students shall answer any one question from each unit.
2. 60% of the questions shall be long-answered type and 40% short-answered type.

Courses of Studies for the M.A./ M. Sc Home Science(Food Science & Nutrition)Examination (Under Course Credit Semester System) Effective from First Semester Examination, 2024-26

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 different research methods.
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 researchmethodology.

2. To learn different types of research designs, methods of data collection and importance of scalingtechnique.

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

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, NewDelhi.
6. Statistics in Psychology & Education – Henry, E. Garett, David Heley andCo.
7. Experimental Design in Psychological Research –Edwards
8. The Quality of Life: Valuation in social Research – R. Mukherjee – Sage publications, NewDelhi.
9. Fundamentals of Statistics- D.N.Elhance.
10. Statistics in Psychology & Education-Garrett &Word

Course No: HSC- 412 Statistics &ComputerApplication 4CH

Course Outcomes

CO1	Understand the basic concepts/Principles of **Statistics &ComputerApplication**
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 forresearch.

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 researchwork.

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- 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, NewDelhi.
6. Statistics in Psychology & Education –Henry,E.Garett, David Heley andCo.
7. Experimental Design in Psychological Research –Edwards
8. The Quality of Life: Valuation in social Research – R. Mukherjee – Sage publications, NewDelhi.
9. Fundamentalsof Statistics-D.N. Elhance.
10. Statistics in Psychology & Education-Garrett &Word

Course No:HSC.413 Nutrition through Lifecycle 4CH

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

Unit-I: Role of dietician, Meal planning: objectives, factors affecting meal planning, dietary calculation using food exchange lists, Type of diets: normal, soft & fluid diets, high &low calorie diet, high protein, high fat & low carbohydrate diets.

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

Books Recommended

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

Course No: HSC. 414 Infancy & ChildhoodDevelopment(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 inchildhood.*

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.BerkBasten-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, NewJersey.
6. The Development of Children- M.Cole&S.Cole-Scientific American Books- Freeman & Co, NewYork.
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, NewYork.

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.

Nutrition though Life Cycle

1. Formulation of food exchange list.
2. Diet plan for infant.
3. Diet plan for pre-school and school going children.
4. Diet plan for adolescents
5. Diet plan for adulthood (Sedentary, Moderate and heavy worker men and women).
6. Diet plan for pregnant women.
7. Diet plan for pregnant women.
8. Diet plan for old age.

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.

DISSERTATION - REVIEW OF RESEARCH PAPERS IN REFERRED JOURNALS

Each student has to select a topic for the review work. He/She shall undertake the work under the supervision of a recognized teacher of the Department. On the basis of the review of literature specifically research papers published in referred Journals on the topic selected, the student has to prepare a report and submit the same for evaluation by the teacher's council. He/ She has to make a presentation of the review report before the faculty, Research scholars and students in the Department. Evaluation of the review report and seminar will be done by the teacher's council of the department.

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:

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

2. 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 (Woven & Nonwoven) : methods and examples of weaving, knitting, felting & bonded fabric construction

Unit-IV: finishing of fabric: different types of chemical and mechanical fishing 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
5.

Course No:HSC.422 Human Physiology &Therapeutic Nutrition 4CH

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 dietaryrequirements.
To be able to recommend and provide appropriate nutrition care for prevention and treatment of variousdisorders.
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: Digestive System: Introduction, structure & function of oral cavity, stomach, small intestine, large intestine, liver. Absorption of food and its excreation.

Etiology, symptoms, nutritional Problems, nutritional requirements& dietary management of Peptic ulcer, gastritis, Jaundice & Viral Hepatitis, cirrhosis of liver, Pancreatitis

Unit-II: Excretory System:Introduction, structure & function of kidney. Etiology, symptoms, nutritional Problems, nutritional requirements& dietary management ofDiseases of kidney (Nephrosis, glomerulonephiritis, renal failure, urinary calculi, dialysis)

Cardiovascular System:Introduction, structure & function of Heart. Blood pressure- Types and factors affecting it. Etiology, symptoms, nutritional Problems, nutritional requirements & dietary management ofheart diseases.

Unit-III: Types and functions of endocrine glands (Pitutary gland, Thyroid gland, Adrenal gland, Islets of Langerhans, pineal gland). Types and functions of exocrine glands (Salivary gland, Mammary gland, Ceruminous gland, Sebaceous gland, Mucous gland). Etiology, symptoms, nutritional Problems, nutritional requirements& dietary management of Obesity, Diabetes mellitus.

Unit IV: Structure and function of female reproductive organ. Etiology, symptoms, nutritional Problems, nutritional requirements& dietary management of PCOD.Nutrition in Cancer- Risk factors symptoms, Nutritional problems in cancer therapy, Nutritional requirements, Dietary management & role of food in prevention of cancer.

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 NewDelhi.
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 Bangalore Printing & Publishing Co. Ltd (BAPPCO)
5. Food, Nutrition & Diet Therapy-L.K.Mahan&Escott.Stump- W.B. SaundersLtd
6. Human Physiology, Alagappa University, Directorate of Distance Education.
7. Guidelines for planning Therapeutic diets- C.Lenka, Akinik Publications, NewDelhi
8. Applied Nutrition & Diet Therapy for Nurses- J Davis, K.Sherer-W.B.Saunders.Co
9. Clinical Nutrition. The Nutrition Society Textbook Series. Blackwell Publishing Company Garrow, J.S., James, W.P.T. and Ralph, A.(2000)
10. Kaufman M. (2007) Nutrition in promoting the public health strategies, principles and practice. Jones and Bartlett Publishers.
11. Park, K. (2009) Park's Textbook of Preventive and Social Medicine, 20th ed. Jabalpur M/s. Banarsidas Bhanot.

CourseNo:HSC-423 Theories of Human Development &FamilyStudies 4CH

Course Outcomes

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

Objectives:

1. To understand the theories of humandevelopment.

2. To gain knowledge on family pattern and policies and changes in contemporary Indianfamilies.

Expected Outcomes:

Student will gain knowledge on theories of Human Development & ideology of family rights & changes in contemporary Indian families & societies.

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 ExchangeTheory

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.BerkBasten-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, NewJersey.
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. BrownPublishers.
8. Child Development: Infancy through Adolescence-A.Clarke Stewart &S.Friedman, Johnwiley, NewYork.
9. Enhancing the Role of the Family as an agent for Social & Economic Development TISSBombay
10. Family Life Education in India –Perspectives, Challenges and application, A. Choudhury Rawat PublicationJaipur.
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 CommunityHealth & 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 deliverysystem.

2. To understand the economic consequences of malnutrition & to learn about the strategies for improving the nutritional status ofcommunities.

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, Community Health Care DeliverySystem- Public health sector and private sector. Malnutrition- definition, types and causes of malnutrition.Important of five food groups and balanced diet in preventing 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, functional food, antioxidants,dietary diversification, biotechnological approaches, development of food mixtures, food preservation, functional food, Antioxidants, 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 ofIndia.
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. Banarsidas Bhanot.
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 Transtheoretical Model of Behavioural Change, ShumakerSA(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 ThomsonWadsworth.

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. Analysis of fabric quality by thread count method.
7. Visit to explore the manufacturing &dyeing process of fabric.

Therapeutic Nutrition

1. Formulation of food exchanges.
2. Diet plan for PCOD patients.
3. Diet plan for Jaundice patients.
4. Diet plan for peptic ulcer patients.
5. Measurement of blood sugar level by use of glucometer.
6. Estimation of glucose in urine by Benedicts test.
7. Diet plan for diabetes mellitus patients.
8. Estimation of total protein and albumin in blood.
9. Estimation of blood urea.

10. Diet plan for Nephritis patients.
11. Diet plan for atherosclerosis patients.
12. Diet plan for hypertension patient
13. Diet plan for obese person.
14. Measurement of haemoglobin level by use of haemoglobinometer.
15. Diet plan for anemic person.

Community Health& Nutrition

1. Analysis of blood pressure using Sphygmomanometer.
2. Analysis of blood glucose using Glucometer.
3. Study of health service system.
4. Assessment of nutritional status of any particular age group
5. Visit to any agency related to health and hygiene.
6. Awareness program for improving health condition**.**
7. Measurement of body temperature by using thermometer/ infrared digital thermometer
8. Measurement of blood pressure by use of sphygnomanometer/ digital blood pressure monitoring machine.

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 and presentation it in the department before the faculty. The feedback and comments received during the seminar presentation shall be suitably incorporated in the work under the advice of the supervisor.

THIRD SEMESTER

Course No: HSC. 511 NutritionalBiochemistry 4CH

Course Outcomes

CO1	Remember and understand the basic concepts/Principles of **NutritionalBiochemistry**
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:

3.To acquire knowledge on metabolic pathways in the human body for regulation of macro and micronutrients.

4. To enrich knowledge in digestion, absorption and utilisationofnutrients

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, ureacycle)

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 &micro 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, NewDelhi.
3. Text Book of Medical Biochemistry –M.NChaterjee& Rana Shinde, Jaypee Brothers, Medical Publishers (P) LtdBangalore.
4. Fundamentals of Biochemistry –J.L.Jain, S.Chand& Company Ltd, Ram Nagar, NewDelhi.
5. Human Physiology Vol I – C.C.Chaterjee, Medical Allied agency, Mahatma Gandhi Road,Calcutta.
6. Human Nutrition & Dietetics – Davidson &Passmare
7. Lehninger's Principles of Biochemistry-D.L.Nelson&M.M.Cox, Macmillan WorthPublishers.
8. A manual of Laboratory techniques-Raghuramulu, N. Madhavan Nair and K.KalyanSundaram – 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:HSC512: FoodProcessing 4CH

Course Outcomes

CO1	Remember and understand the basic concepts/Principles of **FoodProcessing**
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: 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: 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- bacterial infection and pasteurization, freezing, drying and egg substitutes. Fish- 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 processing: Separation, centrifugal process, natural creaming, pasteurization, sterilization, homogenization, effect of processing on nutritive value. Milk products: Khoa, Chnna, 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.Food preparation: Cooking-objectives, preliminary preparation &, methods of cooking, microwave cooking & changes in nutrient during cooking, Food additives, Food adulteration.

Books Recommended:

1. Siddapa, G S(1986) Preservation of Fruits and Vegetables, ICAR PublicationVanLoeseckeHW(1998),
2. Food Technology Series Drying and Dehydration of foods. Allie ScientificPublishers.
3. Salikhe D K and Kadam S S(1995), Handbook of fruit science andtechnology.
4. Production Composition, Storage and processing. Marcel Decker inc, NewYork.
5. Marriott N G (1985), Principles of Food Sanitation 1st Edition. A VI publication USA. De Su Kumar, Milk and milk productstechnology.
6. National Dairy Development Board, Amul, Milk and milk products processing. FPO1955
7. Fabriani, G and Lintas C. (1988) Durum Wheat Chemistry and Technology. American Association of Cereal ChemistryInc.
8. Kent N L.(1993) Technology of Cereals. 4th Edi. PergamonPress.
9. Olson, V M; Shemwell G A and Pasch, S (1998) Egg and Poultry Meat Processing, VCH P, NewYork
10. Winton & Winton, (1991) Techniques of Food Analysis. Allied ScientificPublishers.

Course Code - HSC-513FOOD ANALYSIS AND FOOD QUALITY CONTROL 4CH

Course Outcomes

CO1	Remembers and understands the basic concepts/ principles of food quality control & techniques in food analysis.
CO2	Analyze the various concepts to understand them through case study
CO3	Applied the knowledge in understanding practical problems
CO4	Executes/ Create the project or field assignment as per the knowledge gain in the course.

Objectives:

To understand the basic concepts/ principles of food quality control & techniques in food analysis.
To analyze the various concepts to understand them through case study
To apply the knowledge in understanding practical problems
To executes/ create the project or field assignment as per the knowledge gain in the course.

UNIT-1

Evaluation of food quality: Assessing the quality of food by subjective evaluation(difference test, rating test, sensitivity test, descriptive test) and objective evaluation.

UNIT-2

Food toxins: Term and toxicology; safety evaluation using traditional and modern approach, natural anti nutritional factor toxin phytochemical, microbial toxins, contamination during handling and processing, contaminants from industrial wastages, pesticides residues, toxicity of heavy metal and chemicals in food and their permissible limits.

Food adulteration:food adulteration, types of adulterants, common adulterant in food (milk and milk product, edible oil, cereals and pulses, condiments and spices, beverages) and its detection.

UNIT-3

Food laws & standards: Food laws, Voluntary standards and Certification system, food standardization and Regulation agencies in India, International standards, various organizations dealing with inspection, traceability and authentication, certification and quality assurances (PFA, FPO, MNPO, MPO, AGMARK, BIS).

UNIT-4

Concept, basic instrumentation and principles of PH Meter, Centrifuge, Colorimeter, UV-spectrophotometer, Flame photometer, hot air oven, incubator, muffle furnace, laminr air flow, Auto Clave, micro scope, weighing balance.

Books Recommended:

- Food science, sixth edition, B. Srilaxmi, New Age International(P) Limited.
- Handbook of food toxicology, S.S. Deshpande, Marcel Dekker, 2002.
- Food quality assurances principle and practices, inteazAliI, CRC Press Boca Raton. foodhygiene and sanitation, Roaday S. MeGraw Hill Education, 2011.
- An introduction to food science Technology and quality Management, Bhatt D.K. &Tomar P., Kalyani Publisher.
- Food Analysis , S. Suzanne Nielsen, 3rd Ed. Kluwer Academic, New york, USA., 2003.
- Wilson and Walker Principle and techniques of Biochemistry and Molecular Biologfy, 8th edition Hoffmann A. &Clokies S., Cambridge University Press, 2018.
- Hand Book of Food Analysis instrument,SemihOtles, CRC Press , Boca Ratan, FL, USA. 2009.
- Modern techniques for Food Authentication, Da-Wan Sun, Elsevier Inc., Burlington, MA, USA. 2008.

Course No:HSC.514 Food Microbiology andFoodSafety 4CH

Course Outcomes

CO1	Remember and understand the basic concepts/Principles **Food Microbiology andFoodSafety**
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

1.To understand the nature of microorganisms involved in food spoilage, food infections andintoxications.

2.To understand criteria for microbiological safety in various foods operations to avoid public health hazards due to foodcontamination.

Expected Outcome:

Knowledge on food microbiology and food safety will help students to know role of microorganisms inhuman 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& milk products, 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: 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.

UNIT IV: 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.

Books Recommended:

1. Food Microbiology – M.R.Adams&M.O.Moss, New Age International (P) Limited, NewDelhi.
2. Food Facts and Principles -N. Shakuntala Manay& M. Shadaksharaswamy, New Age International (P) Limited, NewDelhi.
3. Food Science – B.Srilakshmi, New Age international (P) Limited, NewDelhi.
4. Food Microbiology – William C.Frazier, Tata McGraw Hill publishing Company limited, NewDelhi.
5. Food processing and Preservation – G. Subhalakshmi& Shobha A. Udipi, New Age International (P) Limited, NewDelhi.
6. Food Hygiene & Sanitation – S.Roday- Tata McGraw Hill, NewDelhi.
7. Frazier WC, WestoffDC.(1998)Food Microbiology. 4th ed. Tata McGrawHill Publishing Co.Ltd.
8. Garbutt John (1997) Essentials of Food Microbiology. ArnoldLondon.
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 BrownPublishers.

Course No: HSC. 515 Practical related to all theorypapers and Dissertation (Writing of Synopsis &FieldWork) Presentation through a seminar 4CH

Practical related to all theorypapers

Nutritional Biochemistry

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.

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.)

Food Analysis & Food Quality Control

1. To study about the chemical safety measures and general laboratory safety rule.
2. To know the various laboratory and glass wares used for food analysis.
3. To prepare the standard solution.
4. Sensory evaluation of different food products.
5. Adulteration of milk and milk product, edible oil, cereals and pulses, condiments and spices, beverages.
6. To study different food analysis instruments.

Dissertation

Each student has 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 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 for evaluation. 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 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 itsevolution

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: 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, work simplification in kitchen. Storage space: Types of storage, planning & Layout of storage space, sanitation & safety, Service area planning and decoration of service areas.

Unit-III: Importance, step & types of Menu planning, Food production and processing. 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.

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 EasterLimited.
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 hiffPublications.
5. Personal Management in the Hotel& Catering Industries- Boella- HutchinsonPublications.
6. Food Service Systems & Administration- Hitchcock MacmillanPublication.
7. Hotel House Keeping Training Manual- Andrews Snoher-Tata McGraw Hill Publication-NewDelhi.

8. The Practice of Hospitality Management _vol I and II –R.Lewis, T.Begg'sM.Shaw&S.Croffot-AVI Publishing Co.DC.WestPortConnecticut.
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.522 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 OvarianSyndrome.

Books Recommended:

1. Berg, A. (1973) The Nutrition Factor, The BrookingsInstitution,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 BartlettPublishers.
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 byDBT.
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, NewDelhi.
5. Food Hygiene & Sanitation – S.Roday- Tata McGraw Hill, NewDelhi.
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.

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 infoods.*

2. To understand scientific approaches of RDA and BMR and to learn macro and micro nutrient requirements and their effect on humanhealth.

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: Cereals- Wheat, rice, maize, barely, oat, rye- Structure, cultivation, harvesting, properties, composition and commercial value. Meat- Composition, variety. Eggs- Composition, quality factors, storage. Fish- Composition. Milk- composition, factors affecting milk quality, physical and chemical properties.

Unit-II: Properties of foods: Physical properties of solid and liquid food (solution , Vapor pressure , boiling point, freezing point, osmotic pressure, viscosity, surface and interfacial tensions, specific gravity)

Textual properties, thermal properties, optical properties, electrical properties, flow properties, Visco-elastic properties.

Food pigments and colors: some common pigments used in food industry (chlorophylls, myoglobin, anthocyanin, betalain, carotenoids, annatto, synthetic colors& lake /dye colors and other colorants) - structure and stability;

Flavors: types of flavor, flavor compounds, extraction principles of flavor, flavor potentiator or enhancer.

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, calorimetry and Indirect caloriemetry,Resting energy expenditure,Factors effecting Physical activity,Factors affecting Basal metabolic Rate, Factors Affecting the Thermic Effect ofFood.

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, NewDelhi.
5. Dietetics – B.Srilakshmi; New age International (P) Limited, NewDelhi.
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.Pralhadrao& 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.
12. A Textbook of Food Nutrition & Dietetics- Rehena Begum Sterling publications Pvt Ltd-2015

Course No:HSC. 524 &525 DISSERTATION - ANALYSIS & INTERPRETATION, PRESENTATION THROUGH A SEMINAR 8CH

Each student has to carry out the dissertation work immediately after registration into Fourth 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 through a PPT presentation. 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

Course Outcomes

CO1	Remember and understand the basic concepts/Principles of **Home Science**
CO2	Analyse the various concepts to understand the extention, communication and family management skills.
CO3	To understand the well being of the families and communities.
CO4	To understand the basics of textile.

Objectives: To understand and appreciate role of Home Science, in the development and well-being of individuals, families and communities.

Expected Outcome:

Improve knowledge on food and nutrition will help students to plan balanced diet using food groups

and can know the basics of textile and family management.

Unit – I :-

Basic five food groups, classification of nutrients, introduction, classification, function, sources, deficiency, requirement (RDA) of different macro nutrients.

Unit – II :-Introduction, classification, function, sources, deficiency, requirement (RDA) of different micro nutrients(vitamin A,D,E,K,B1,B2,B9,C, Minerals-Iron, Calcium, Iodin, Phosphorus).

Food preservation : reasons of food spoilage, methods of food preservation (Bacteriostatic , bactericidal)

Unit – III :-

FRM :- Definition of management , types & characteristics of resources,

Textile :- classification of fiber: natural & manmade, properties of silk, wool, & cotton.

HDFS :- Principles of child development, stages of prenatal development : zygote, embriyo, fetus.

Extension :- Definition & principles of Extension.

Communication:- Definition, elements and types Communication.

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 Nutriton and Dietetics- Davidson andPassmore
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, NewDelhi.
7. Management In Family Living by NICKELL P
8. Education And Communication For Development by DAHAMA O.P

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