

# **M.A/M.Sc. PROGRAMME IN HOME SCIENCE (FOOD & NUTRITATION)**



(Effective from Session 2026-27)

**(Batch: 2026-2028)**



**SAMBALPUR UNIVERSITY**

**IVOTI VIHAR, BUDA, SAMBALPUR, ODISHA 750010**



**SEMESTER-WISE COURSE STRUCTURE FOR THE TWO YEARS  
P.G PROGRAMME IN UNIVERSITY P.G DEPARTMENT AND  
COLLEGES UNDER SAMBALPUR UNIVERSITY**

**TO BE EFFECTIVE  
FROM 2025-26  
BATCH: 2025-27**

**(Ref: letter No: 4873/Acd.-I Dated 21.08.2023)**

| For (Science/ Humanities/Social Sciences/ Commerce) |                                                                          |                                                                            |                          |              |
|-----------------------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------|--------------|
| Semester                                            | Core Course Credit                                                       | Additional Course                                                          | Additional Course Credit | Total Credit |
| First                                               | 20                                                                       | AECC I: Environmental Studies and Disaster management                      | 2                        | 22           |
| Second                                              | 20                                                                       | Inter Dept. Course (IDC) or open elective                                  | 3                        | 23           |
| Third                                               | 20                                                                       | AECC II: Entrepreneurship Development                                      | 2                        | 22           |
| Fourth (including project of 4 credit)              | 20                                                                       | MOOCs one paper                                                            | 3                        | 23           |
| <b>TOTAL</b>                                        | <b>80</b>                                                                |                                                                            | <b>10</b>                | <b>90</b>    |
|                                                     | <b>Total credit for 2 years course = 90 Credits</b>                      |                                                                            |                          |              |
|                                                     | Furthermore, following non - credit course will be taken by the students |                                                                            |                          |              |
| 1. Yuva Sanskar                                     |                                                                          | 2. N.C.C/N.S. S/Sports/Performing Arts/Yoga (Of which one has to be opted) |                          |              |

**Mission**

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

**Programme Education Objectives (PEO)**

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

**Programme Outcomes (PO)**

|            |                                                                                                                                                                                                                                                                                                                |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PO1</b> | <b>Environment and sustainability:</b> 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.                                                      |
| <b>PO2</b> | <b>Home Science and Society:</b> 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.                                                         |
| <b>PO3</b> | <b>Communication-</b> Use of soft skills for clear, contextual, accurate, meaningful, unambiguous effective communication using verbal and nonverbal skills at inter/ intra personal and professional level.                                                                                                   |
| <b>PO4</b> | <b>Ethics and Integrity-</b> Apply ethical practices while data collection, conducting experiments, involving human beings as well as animals, delivering professional capabilities. And reporting.                                                                                                            |
| <b>PO5</b> | <b>Planning Skills:</b> Apply skills in designing, implementing, monitoring and evaluating programmes effectively for individuals, family, community.                                                                                                                                                          |
| <b>PO6</b> | <b>Leadership Skills:</b> 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. |
| <b>PO7</b> | <b>Practical Work-</b> Provides opportunity to students to get acquainted with innovative research projects and develop skills to plan and undertake intervention projects.                                                                                                                                    |
| <b>PO8</b> | <b>Life Long Learning-</b> 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) /M.Sc in Home Science  
Examination (Under Course Credit Semester System) Effective from First Semester Examination, 2026-28**

| <b>Course No.</b>                       | <b>Title</b>                                   | <b>Credit Hour</b> | <b>Mark Distribution</b> | <b>Total Mark</b> |
|-----------------------------------------|------------------------------------------------|--------------------|--------------------------|-------------------|
| <b><u>1<sup>st</sup> Semester</u></b>   |                                                |                    |                          |                   |
| HSC. 411                                | Research Methodology                           | 4(Theory)          | 20+80                    | 100               |
| HSC. 412                                | Nutrition through life cycle                   | 4(Theory)          | 20+80                    | 100               |
| HSC. 413                                | Statistics & Computer Application              | 4(Theory)          | 20+80                    | 100               |
| HSC. 414                                | Infancy and Childhood Development              | 4(Theory)          | 20+80                    | 100               |
| HSC. 415                                | Practical I                                    | 2(Practical)       | 100                      | 100               |
| HSC. 416                                | Practical II                                   | 2(Practical)       | 100                      | 100               |
| 417                                     | Environmental Studies and Disaster Management  | 2                  | 40+60                    | 100               |
| <b>Total</b>                            |                                                | <b>22</b>          |                          | <b>700</b>        |
| <b><u>II<sup>nd</sup> Semester</u></b>  |                                                |                    |                          |                   |
| HSC. 421                                | Basics of Textile                              | 4(Theory)          | 20+80                    | 100               |
| HSC. 422                                | Community Health & Nutrition                   | 4(Theory)          | 20+80                    | 100               |
| HSC. 423                                | Theories of Human Development & Family Studies | 4(Theory)          | 20+80                    | 100               |
| HSC. 424                                | Human physiology & Therapeutic Nutrition       | 4(Theory)          | 20+80                    | 100               |
| HSC. 425                                | Practical III                                  | 2(Practical)       | 100                      | 100               |
| HSC. 426                                | Practical IV                                   | 2(Practical)       | 100                      | 100               |
| HSC 427                                 | Inter Disciplinary Course (IDC)                | 3                  | 40+60                    | 100               |
| <b>Total</b>                            |                                                | <b>23</b>          |                          | <b>700</b>        |
| <b><u>III<sup>rd</sup> Semester</u></b> |                                                |                    |                          |                   |
| HSC. 511                                | Nutritional Biochemistry                       | 4(Theory)          | 20+80                    | 100               |
| HSC. 512                                | Food Processing                                | 4(Theory)          | 20+80                    | 100               |
| HSC. 513                                | Food Analysis & Food Quality Control           | 4(Theory)          | 20+80                    | 100               |
| HSC. 514                                | Food Microbiology & Food safety                | 4(Theory)          | 20+80                    | 100               |
| HSC. 515                                | Practical V                                    | 2(Practical)       | 100                      | 100               |
| HSC. 516                                | Practical VI                                   | 2(Practical)       | 100                      | 100               |
| 517                                     | Entrepreneurship Development                   | 2                  | 40+60                    | 100               |
| <b>Total</b>                            |                                                | <b>22</b>          |                          | <b>700</b>        |
| <b><u>IV Semester</u></b>               |                                                |                    |                          |                   |
| 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 - Seminar Presentation            | 4(Practical)       | 100                      | 100               |
| HSC 525                                 | Dissertation -Analysis & interpretation        | 2(Practical)       | 100                      | 100               |
| HSC 526                                 | Dissertation- final viva                       | 2(Practical)       | 100                      | 100               |
| HSC 527                                 | MOOC/ A. MOOC                                  | 3                  |                          | 100               |

## Instruction to Paper Setters

## M.A/M.Sc in Home Science

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.  
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, 2026-28

## DETAILED COURSES OF STUDIES

### FIRST SEMESTER

Course No: HSC. 411 Research Methodology (Theory)

4CH

### Course Outcomes

|     |                                                                                     |
|-----|-------------------------------------------------------------------------------------|
| CO1 | Understand the basic concepts/Principles of <b>Research Methodology</b>             |
| 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 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 process.

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- New Delhi
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 Pvt Ltd.
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 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.

**Course No:HSC.412**

**Nutrition through Lifecycle**

**4CH**

**Course outcomes**

|     |                                                                                                         |
|-----|---------------------------------------------------------------------------------------------------------|
| CO1 | Remember and understand the basic concepts/Principles of <b>Nutrition through Lifecycle</b>             |
| 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:** 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 Anaemia 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**

1. Human Nutrition and Dietetics- Davidson and Passmore
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 Publishing Co. 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, New Delhi.
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- 413 Statistics &Computer Application**

**4CH**

**Course Outcomes**

|     |                                                                                                              |
|-----|--------------------------------------------------------------------------------------------------------------|
| CO1 | Understand the basic concepts/Principles of <b>Statistics &amp;ComputerApplication</b>                       |
| 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- New Delhi
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 PVT Ltd.
4. Methodology and Techniques of Social Research – P.L. Bandarkar &T.S.Wilkinson –Himalaya Publishing

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 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. 414 Infancy & Childhood Development (Theory)****4CH****Course Outcomes**

|     |                                                                                                     |
|-----|-----------------------------------------------------------------------------------------------------|
| CO1 | Remember and understand the basic concepts/Principles of <b>Infancy &amp; Childhood Development</b> |
| 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 be 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 pattern 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, 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, New York.

7. Child Development- An Introduction – J.W. Santrock & S.K. Yussen Iowa WMC. ~~Wiley, New York~~ **Home Science**
8. Child Development: Infancy through Adolescence-A. Clarke Stewart & S. Friedman, John Wiley, New York.

**Course No- HSC415, Course Title – Practical I    2 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.

**Nutrition through Life Cycle**

1. Formulate a food exchange list by classifying foods into groups based on their similar nutritional composition in order to facilitate balanced diet planning.
2. Plan a nutritionally balanced diet for infants according to their age and developmental requirements to ensure proper growth and development.
3. Prepare a balanced diet plan for pre-school and school-going children that meets their nutritional needs for growth, development, and daily activities.
4. Design a balanced diet plan for adolescents in order to meet the increased nutritional requirements during the period of rapid growth and physiological changes.
5. Plan appropriate diet patterns for adults with different levels of physical activity, namely sedentary, moderate, and heavy workers, to maintain optimal health.
6. Prepare a nutritionally adequate diet plan for pregnant women to support maternal health and the proper growth and development of the fetus.
7. Develop a balanced diet plan for lactating mothers to ensure adequate nutrient intake for breast milk production and maternal well-being.
8. Plan a suitable diet for elderly individuals that fulfills their nutritional needs while considering age-related physiological changes and digestive capacity.

**Course No- HSC416, Course Title – Practical II                    2 CH**

**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.

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****4 CH****Course Outcomes**

|     |                                                                                                                        |
|-----|------------------------------------------------------------------------------------------------------------------------|
| CO1 | Remember and understand the basic concepts/Principles of <b>Basics of Textile</b>                                      |
| 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 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****M.A/M.Sc in Home Science**

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 No: HSC. 422 Community Health & Nutrition****4 CH****Course Outcomes**

|     |                                                                                                  |
|-----|--------------------------------------------------------------------------------------------------|
| CO1 | Remember and understand the basic concepts/Principles of <b>Community Health &amp; Nutrition</b> |
| 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, Community Health Care Delivery System- 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, NIPCCD, 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, 20<sup>th</sup> ed. Jabalpur M/s. Banarsidas Bhanot.
5. Nutrition Science – B.Srilakshmi, New Age international (P) Limited, New Delhi.

6. Food Hygiene & Sanitation – S.Roday- Tata McGraw Hill, NewDelhi. **M.A/M.Sc in Home Science**
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.

**CourseNo:HSC-423**

**Theories of Human Development & Family Studies**

**4CH**

### Course Outcomes

|     |                                                                                                                    |
|-----|--------------------------------------------------------------------------------------------------------------------|
| CO1 | Remember and understand the basic concepts/Principles of <b>Theories of Human Development &amp; Family Studies</b> |
| 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 human development.
2. To gain knowledge on family pattern and policies and changes in contemporary Indian families.

### 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 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, New York.
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 application, A. Choudhury Rawat Publication Jaipur.
11. Family in Transition: Power & Development, J.K. Barala & A. Choudhury, Northern Book Center,
12. Family Dynamics: Social Work Perspectives, A. Khasgiwala, 1993, Anmol, New Delhi.

**Course No: HSC.424 Human Physiology & Therapeutic Nutrition**

**4CH**

#### **Course outcomes**

|     |                                                                                                              |
|-----|--------------------------------------------------------------------------------------------------------------|
| CO1 | Remember and understand the basic concepts/Principles of Therapeutic <b>Nutrition</b>                        |
| 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:** Digestive System: Introduction, structure & function of oral cavity, stomach, small intestine, large intestine, liver. Absorption of food and its excretion.

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 of Diseases of kidney (Nephrosis, glomerulonephritis, 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 of heart diseases.

**Unit-III:** Types and functions of endocrine glands (Pituitary 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. **M.A/M.Sc in Home Science**
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, 20<sup>th</sup> ed. Jabalpur M/s. Banarsidas Bhanot.

### **Course No- HSC425, Course Title – Practical III**

**2 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.

#### **Community Health& Nutrition**

1. Study and Preparation of a Flow Diagram of the Community Health Care Delivery System in India
2. Identify and classify different types of malnutrition such as Kwashiorkor, Marasmus, and Anemia based on their causes and clinical features.
3. Assess the nutritional status of an individual using anthropometric measurements (height, weight, BMI and MUAC) according to standards of World Health Organization.
4. Assess the daily nutrient intake of an individual using the 24-hour dietary recall method and compare it with the recommended dietary allowances.
5. Examine an individual for clinical signs of nutrient deficiencies through physical examination.
6. Measurement of body temperature by using thermometer/ infrared digital thermometer.

### **Course No- HSC426, Course Title – Practical IV**

**2 CH**

#### **Human Physiology & Therapeutic Nutrition**

1. Observe and identify the histological structure of different human organs under a microscope.

2. Determine the blood glucose level using a glucometer for the assessment of blood sugar.
3. Formulate a therapeutic diet plan for patients with diabetes mellitus to help regulate blood glucose levels and maintain overall health.
4. Measure the hemoglobin level in blood using a hemoglobino meter and detect anemia.
5. Formulate a diet plan rich in iron and other essential nutrients for individuals suffering from anemia to improve hemoglobin levels and overall health.
6. Plan a therapeutic diet suitable for patients with peptic ulcer in order to reduce gastric irritation and promote healing of the gastrointestinal tract.
7. Prepare an appropriate diet plan for patients suffering from jaundice to support liver function and promote recovery.
8. Measure the blood pressure level by using Sphygmomanometer
9. Design a diet plan for patients with atherosclerosis aimed at reducing blood cholesterol levels and promoting cardiovascular health.
10. Design a balanced therapeutic diet plan for patients with Polycystic Ovarian Disease (PCOD) to help regulate hormonal imbalance and maintain healthy body weight.
11. Prepare a therapeutic diet plan for patients with nephritis to reduce the workload on the kidneys and maintain proper nutritional balance.

### 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      Nutritional Biochemistry**

**4CH**

#### Course Outcomes

|     |                                                                                          |
|-----|------------------------------------------------------------------------------------------|
| CO1 | Remember and understand the basic concepts/Principles of <b>Nutritional Biochemistry</b> |
| 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 utilisation of nutrients

#### **Expected Outcome:**

Gaining knowledge on nutritional bio- chemistry will enable the students to understand how the

**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, New Delhi.
3. Text Book of Medical Biochemistry – M.N.Chatterjee & Rana Shinde, Jaypee Brothers, Medical Publishers (P) Ltd Bangalore.
4. Fundamentals of Biochemistry – J.L.Jain, S.Chand & Company Ltd, Ram Nagar, New Delhi.
5. Human Physiology Vol I – C.C.Chatterjee, 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:HSC512: Food Processing**

**4CH**

**Course Outcomes**

|     |                                                                                                            |
|-----|------------------------------------------------------------------------------------------------------------|
| CO1 | Remember and understand the basic concepts/Principles of <b>FoodProcessing</b>                             |
| 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, analysis 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, 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/ drying, canning, preserves: jam, jelly, marmalade, pickle, 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 Publication
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 products 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 Code - HSC-513 FOOD 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 approaches. 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, laminar air flow, Autoclave, microscope, 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 assurance principle and practices, Intez Ali, CRC Press Boca Raton.
- Food hygiene and sanitation, Roaday S. McGraw Hill Education, 2011.
- An introduction to food science Technology and quality Management, Bhatt D.K. & Tomar P., Kalyani Publisher.
- Food Analysis, S. Suzanne Nielsen, 3<sup>rd</sup> Ed. Kluwer Academic, New York, USA., 2003.
- Wilson and Walker Principle and techniques of Biochemistry and Molecular Biology, 8<sup>th</sup> edition Hoffmann A. & Clokie S., Cambridge University Press, 2018.
- Hand Book of Food Analysis instrument, Semih Otles, CRC Press, Boca Raton, FL, USA. 2009.
- Modern techniques for Food Authentication, Da-Wan Sun, Elsevier Inc., Burlington, MA, USA. 2008.

**Course No:** HSC.514

**Food Microbiology and Food Safety**

**4CH**

### Course Outcomes

|     |                                                                                                |
|-----|------------------------------------------------------------------------------------------------|
| CO1 | Remember and understand the basic concepts/Principles <b>Food Microbiology and Food Safety</b> |
| 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 and intoxications.
2. To understand criteria for microbiological safety in various food 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 & milk products, Bread, Canned food, Vegetables and

fruits, Fruit juices, Meat, Eggs and Fish.

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

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, Course Title – Practical V**

**2 CH**

**Nutritional Biochemistry**

1. Determine the total carbohydrate content in different food samples using the Anthrone method.
2. Estimation of Total Protein in Food Samples by Lowry's Method.
3. Estimation of Total Lipid Content in Food Samples using Soxhlet Method.
4. Estimation of Iron in Food Samples using Colorimetric / Atomic Absorption Spectrophotometer.
5. Estimation of Calcium in Food Samples using Colorimetric Method or Atomic Absorption Spectrophotometer (AAS).

**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.

**Course No- HSC 516, Course Title – Practical VI**

**2 CH**

**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.)

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

### **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 <b>Institutional Food Management</b>                           |
| 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: 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**

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

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.3<sup>rd</sup> Edition John Willey &Sons.

**Course No:HSC.522    Concerns in Public Health & Nutrition**

**4CH**

### **Course Outcomes**

|     |                                                                                                        |
|-----|--------------------------------------------------------------------------------------------------------|
| CO1 | Remember and understand the basic concepts/Principles <b>Concerns in Public Health &amp; Nutrition</b> |
| 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 of 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 (Subspecialty 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-523 Advance Food Science & Nutrition**

**4CH**

**Course Outcomes**

|     |                                                                                                      |
|-----|------------------------------------------------------------------------------------------------------|
| CO1 | Remember and understand the basic concepts/Principles of <b>Advance Food Science &amp; Nutrition</b> |
| 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:** 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, ~~Myo/MS in Home Science~~ 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 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. Pralhadrao & Vinodini Reddy, Oxford & IBH Publishing Co. Pvt. Ltd.
8. Nutrition Science-B. Srilakshmi, New Age International Publication-2012.
9. Food Science and Nutrition-Sunetra Roday-Oxford University Press-2016.
12. A Textbook of Food Nutrition & Dietetics- Rehana Begum Sterling publications Pvt Ltd-2015

### **Course No: HSC. 524, 525 & 526, Practical VII, VIII, IX**

#### **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 through a seminar, 25% to the evaluation of content and rest 25% to seminar final presentation & viva voce by the examiners.

### **HSC 427 - IDC :- HOME SCIENCE**

**Course Outcomes****M.A/M.Sc in Home Science**

|     |                                                                                                       |
|-----|-------------------------------------------------------------------------------------------------------|
| CO1 | Remember and understand the basic concepts/Principles of <b>Home Science</b>                          |
| CO2 | Analyse the various concepts to understand the extension, 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, Iodine, 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, embryo, 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 Nutrition and Dietetics- Davidson and Passmore
5. Park, K. (2009) Park's Textbook of Preventive and Social Medicine, 20<sup>th</sup> ed. Jabalpur M/s. Banarsidas Bhanot.
6. Nutrition Science – B.Srilakshmi, New Age international (P) Limited, New Delhi.
7. Management In Family Living by NICKELL P
8. Education And Communication For Development by DAHAMA O.P

**HSC 527- Alternate Course for MOOC (3 Credit Hours)**

**Course Name:** Community Extension

UNIT – 1: Extension Education

- a) Definition of Extension Education
- b) Classification of Extension Education (Formal and Informal)
- c) Objectives of Extension Education
- d) Basic Philosophy of Extension Education
- e) Principles of Extension Education

- a) Meaning and Definition of Communication
- b) Characteristics and Elements of Communication
- c) Types of Communication with merits and demerits (Individual, Group, Mass, Verbal, Non-verbal)
- d) Models of Communication (Aristotle's Model, Shannon-Weaver Model, Westley & MacLean Model, Leagan's Model, Berlo's Model)

UNIT – 3: Rural Sociology

- a) Definition of Rural Sociology
- b) Meaning and Importance of Rural Sociology
- c) Characteristics of Rural Society and Urban Life
- d) Amenities and Services for Rural Development: Education, Health, and Medical Facilities
- e) Characteristics and Role of Extension Worker

**References**

1. Dahama, O.P. and Bhatnagar, O.P. (2005). *Education and Communication for Development*. New Delhi: Oxford & IBH Publishing Company.
2. Gupta, Y.S. (2003). *Handbook of Reporting and Communication Skills*. New Delhi: Concept Publishing Company.
3. Dubey, V.K. (2008). *Extension Education and Communication*. New Age International.
4. Dahama, O.P. & Prasad, R. (1966). *Extension and Rural Welfare*. Agricultural Extension Work.
5. *Fundamentals of Agricultural Extension Education*. Department of Extension Education, JNKVV, Jabalpur (M.P.).