M.A/M.Sc in Home Science

(Food & Nutrition)

SYLLABUS (2020-22)

P.G. DEPARTMENT OF HOME SCIENCE

SAMBALPUR UNIVERSITY

JYOTI VIHAR

Courses of Studies for the M.A/ M.Sc Home Science (Food & Nutrition)
Examination(Under Course Credit Semester System)Effective from First Semester Examination, 2020-22

1st Semester		
Course No.	**Title**	**Credit Hour**
HSC. 411	**Research Methodology**	**4 (Theory)**
HSC. 412	**Statistics &Computer Application**	**4 (Theory)**
HSC. 413	**Nutrition through life cycle**	**4 (Theory)**
HSC. 414	**Advance Food Science & Nutrition**	**4 (Theory)**
HSC. 415	**Practical related to 411&412**	**2 (Practical)**
HSC. 416	**Practical related to 413&414**	**2 (Practical)**
	Total	**20**
IInd Semester		
Course No.	**Title**	**Credit Hour**
HSC. 421	**Institutional Food Management**	**4 (Theory)**
HSC. 422	**Environmental Management**	**4 (Theory)**
HSC. 423	**Guidance & Counseling**	**4 (Theory)**
HSC. 424	**Nutrition Communication for Health promotion**	**4 (Theory)**
HSC. 425	**Practical related to all the theory papers**	**3 (Practical)**
HSC. 426	**Writing of Term Paper & Seminar**	**1**
	Total	**20**
IIIrd Semester		
Course No.	**Title**	**Credit Hour**
HSC. 511	**Therapeutic Nutrition**	**4 (Theory)**
HSC. 512	**Nutritional Biochemistry**	**4 (Theory)**
HSC. 513	**Food Microbiology & Food safety**	**4 (Theory)**
HSC. 514	**Programme Planning in Public Health Nutrition**	**4 (Theory)**
HSC. 515	**Practical related to all the theory papers**	**2 (Practical)**
HSC. 516	**Dissertation (Writing of Synopsis & Field Work)**	**2**
	Presentation through a seminar (to be completed in IVth Semester)	
	Total	**20**
IVth Semester (A candidate has to select any three elective theory papers)		
Course No.	**Title**	**Credit Hour**
HSC. 521	**Public Health Nutrition**	**4 (Theory elective)**
HSC 522	**Public Health Aspect of Malnutrition**	**4 (Theory elective)**
HSC. 523	**Advance Clinical nutrition**	**4 (Theory elective)**
HSC. 524	**Entrepreneurship in Food Service**	**4 (Theory elective)**
HSC 525	**Food Processing**	**4 (Theory elective)**
HSC. 526	**Dissertation**	**6**
HSC 527	**Seminar**	**2**
	Total	**20**

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 them M.A./ M. Sc Home Science(Food Science & Nutrition)Examination (Under Course Credit Semester System) Effective from First Semester Examination, 2020-22

DETAILED COURSES OF STUDIES

FIRST SEMESTER

Course No: HSC. 411 Research Methodology (Theory) 4CH

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, Research Process, Criteria of a good Research. Research Problem, defining a research problem, selecting the problem, technique involved in defining a problem. Thrust areas in research in Home Science.

Unit-II: Research Design: Meaning need & feature of a good design. Different types of research design, Experimental Research Design. Sampling design, Census and sample survey, Steps in sampling design, 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. Garett, 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.

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 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.Gar ett, David Heley and Co.
7. Experimental Design in Psychological Research – Edwards
8. The Quality of Life: Valuation in social Research – R. Mukherjee – Sage publications, New Delhi.
9. Fundamentals of Statistics-D.N. Elhance.
10. Statistics in Psychology & Education-Garrett & Word

Course No: HSC. 413 Nutrition through Life cycle 4CH

Objectives:

1.To enhance knowledge of students about physiological changes and nutritional requirements during various stages of life cycle.
2. To understand problems of different age groups and its managements.

Expected Outcome:

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

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

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

Unit-III: Nutrition for adolescents:, Physical & 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 physiological changes in body: 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: Physical & physiological changes, nutritional requirements. Problems of old age, Degenerative diseases, Exercise and old age, Drugs and old age.

Books Recommended

1. Human Nutriton 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, NFI Publications.
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 college publication
10. Text Book of Human Nutrition- M.S.Bamji, P.N.Rao & V. Reddy- Oxford & IBH Publishing Co. PVT Ltd.

Course No: HSC-414 Advance Food Science & Nutrition 4CH

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:

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

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

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

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

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

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

Books Recommended

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

SECOND SEMESTER

Course No: HSC. 421 Institutional Food Management **4CH**

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

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

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

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

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

Books Recommended

1. Catering Management – an integrated approach- M.Sethi & S.Malhon, Wiley Easter Limited.

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

Course No: HSC. 422 Environmental Management (Theory) 4CH

Objectives:

1. To acquire knowledge about components of environment and impact of population growth on environment.
2. To understand causes and effects of environmental pollution and its impact on human health.

Expected Outcome:

Studying environmental management will help to enrich knowledge about environment, population and environment, environmental pollution, and public health hazards due to pollution.

Unit-I: Environment: Components of environment, factors influencing environment, elements of environment. Atmospheres: (Troposphere, Mesosphere, Ionosphere, Exosphere, Hydrosphere, Lithosphere, Biosphere), Physico-chemical factors in the environment, changes in environment, National resources-conservation & sustainable development.

Unit-II: Population & Environment: population density, mortality, Dispersion, age distribution, population growth curve, age pyramid, carrying capacity, community, structure, population growth & natural resources, Impact of population, growth on economic development & environment.

Unit-III: Environmental Pollution: Definition, types of pollutants, Agents causing pollution, classification, effects of pollution- Air pollution, sources, air pollutants, effects of air pollution & its control. Water Pollution: sources, water pollutants, effects of water pollution & its control. Noise Pollution: effect & control of noise pollution, Land degradation, causes, effect & control, waste disposal, legal provisions to control pollution.

Unit-IV: Environment and Public Health: Epidemiology, transmission of communicable diseases, water, air, vector and food borne diseases, environmental pollution & community health, chemical insecticides & its impact on health, toxic action of metals & biological substances, sanitation measure to prevent & control the spread of diseases, vector control.

Books Recommended

1. Environmental Studies- A.K.Patra, Kalyani Publishers, New Delhi.
2. Public Health & Hygiene- G. Biswal & C. Lenka, Kalyani Publishers, New Delhi .
3.Fundamentals of Environmental Studies-S.N.Tripathy & Sunakar Panda, Vrinda Publications (P) Ltd, Delhi.
4.Environment & Society- P.C.Mishra & R.C.Das, Macmillan India Limited, New Delhi.
5.Fundamentals of Environmental Studies- N.K.Tripathy, Taratarinin Pushtakalaya, Berhampur, Orissa.
6.Man & Environment- M.C.Dash & P.C.Mishra, Macmillan India Limited, Kolkata.
7.A Text Book on Environmental Pollution & Control- H.S.Bhatia, New Delhi.
8.Environmental pollution & Development: Environmental Law, policy & Role of Judiciary- C.Pal, Mittal Publishers, New Delhi.
9.Environmental Education Problems & prospects- R.Ghanta & B.D.Rao, Discovery, New Delhi.
10.Sustainable development & Environment, vol. I- Amit khanna De *et al.* , Cosmo Publisher, New Delhi.

Course No: HSC. 423 Guidance & Counseling **4 CH**

Objectives:
1. To understand need of guidance and counselling in educational settings.
2. To enrich knowledge on counselling, its concept, purpose and importance of vocational guidance and counselling.

Outcome:
Enrich knowledge on guidance and counselling will help the students, teachers and social workers to take right decisions for their vocation as well as life.

Unit-I: Guidance; concept, nature, need & scope of Guidance, principles, basic assumptions, functions of Guidance, different areas of guidance, (educational, vocational, social, moral, health, personal, marital), types of guidance, group guidance techniques.

Unit-II: Counseling: Definition, counseling and psychotherapy, purpose & scope of counseling, levels of classifications of counseling, counseling techniques, types and areas of counseling, counseling and related field, process of counseling.

Unit-III: Educational Guidance & counseling: Purpose, function and need of educational guidance, Guidance & counseling at elementary, secondary school level & at college level, the role of teacher's in counseling, educational counseling & curriculum, counseling & home educational guidance programmes & activities.

Unit-IV: Vocational guidance & counseling: Importance, basic assumptions & purpose of vocational guidance, factors in vocational guidance, Relation of educational & vocational guidance, vocational guidance at different stages, factors affecting occupational & vocational choice, vocational adjustments, distinction between vocational counseling and vocational guidance.

Books Recommended

1. Educational & vocational guidance in secondary schools – S.K.Kochhar, Steerling publisher Pvt. Ltd, New Delhi.
2. Counseling and Guidance, S.Narayan Rao tata McGraw Hill Publishing Company Limited,
3. Counseling skills Training- P.Burnard, Viva Books, New Delhi.
4. Counseling: the Skills of finding solutions to Problems, R.Manthei, Routledge, London.
5. Individual Counseling: Therapy & practice, D.Nicolson & H.Ayers, David Fulton, London.
6. Encyclopedia of Guidance & counseling- Mittal Publications, New Delhi.
7. Educational & Vocational Guidance- R.Singh, Common Wealth Publishers, New Delhi.
8. Guidance & Counseling- I. Madhukar, Authe press Global Network..
9. Principles of Guidance & Counseling- M.Asche Sarup & sons, New Delhi.
10. Guidance & Educational Counseling- S.K.Chibber- Common Wealth Publishers

Course No: HSC. 424 Nutrition Communication for Health Promotion **4 CH**

Objectives
1.To be familiar with the national/international dietary guidelines addressing nutrition and health aspects & to learn about the determinants of food behaviour. 2.To be able to plan, implement and evaluate behaviour change communication for promotion of nutrition and health among the vulnerable groups.

Expected Outcome:
Knowledge on Nutrition Communication for health promotion will help students to gain knowledge on dietary guidelines, behaviour change communication for nutrition and health promotion and different nutrition policy and programmes.

Unit I Dietary guidelines for nutrition and health related concerns :National / international guidelines and their role in nutrition promotion. Critical appraisal of the current guidelines.

Unit II Nutrition and Behaviour Inter-relationship :Food and health behaviour, models/theories of health behaviour, food choice, strategies for intervention at the ecological and individual level

Unit III Behaviour Change Communication for nutrition and health promotion**:** Concept and objectives of

communication for behaviour change**.** Planning of communication strategies for behaviour change programme. Developing nutrition education plan, identifying communication strategies and approaches for nutrition and health promotion (e.g. social marketing), designing nutrition and health messages, selecting communication channels, developing and field testing of communication materials, designing training strategy for trainers and building capacity. Implementing behaviour change communication intervention. Evaluation of communication for behaviour change programmes.

Unit IV:Measures to combat malnutrition: National nutrition Policy & Programmes, Supplementary feeding programmes, Role of ICDS & national & international agencies in combating malnutrition (WHO, FAO, UNICEF,NIN, NFI, FNB, NNMB, CFTRI) Role of food technology in combating malnutrition (development of food mixtures, food fortification, food preservation & new foods).

Books Recommended

1. 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, Shumaker SA(Eds).
2. Public Health Communication: Evidence for Behavior Change by Robert C. Hornik © 2002 by Lawrence Erlbaum Associates, Inc.
3. Communication and Health: Systems and Applications. Edited by Eileen Berlin Ray and Lewis Donohew © 1990 by Lawrence Erlbaum Associates, Inc.
4. Designing health messages: Approaches from Communication Theory and Public Health Practice. Editors: Edward Maibach and Roxanne Louiselle Parrott © 1995 by Sage Publications, Inc.
5. Community Nutrition in Action: An Entrepreneurial Approach. Fourth Edition. Marie A. Boyle and David H. Holben. © 2006 Thomson Wadsworth.
6. Blackwell Publishing.

Course No: HSC. 425 Practical Related to all theory papers (Practical) 3CH

To be decided by the teachers council of the Department

Course No: HSC. 426 Writing of Term Paper & Seminar 1CH

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

THIRD SEMESTER

Course No: HSC. 511 Therapeutic Nutrition 4CH

Objectives

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

2.To learn principles of dietary counselling & gain knowledge of the principles of diet therapy.

Expected Outcomes

Understanding foods nutrition will help students & individuals to plan, prepare &

Unit-I: Therapeutic Nutrition: Therapeutic adoption of normal diets (normal, soft & fluid diets) factors to be considered in planning therapeutic diets, drugs & diet inter-action, special feeding methods, pre& post operative diets, role of dietician, dietary calculation using food exchange lists, high & low calorie diet, high protein, high fat,& low carbohydrate diets.

Unit-II: Therapeutic Diets: Etiology, symptoms, nutritional Problems, nutritional requirements& dietary

management of the Followings: Fever & infection (Zika Virus & Ebola), Peptic Ulcer, Gastritis, Constipation (Low residue diet) ,Jaundice & Viral Hepatitis, cirrhosis of liver, Pancreatitis (High protein, high carbohydrate moderate fat or fat restricted diet)

Unit-III: Therapeutic Diets: Etiology, Symptoms, nutritional problems, nutritional requirements & dietary management of the followings: Diabetes mellitus (metabolic disorder), Obesity, Diseases of kidney (Nephrosis, glomerulonephiritis, renal failure, urinary calculi, dialysis) (controlled protein, potassium & sodium diet)

Unit-IV: Therapeutic Diets: Etiology, symptoms, nutritional Problems, nutritional requirements and dietary management of cardio vascular disorder-Atherosclerosis (fat controlled diet) Heart disease (sodium restricted diet) Hypertension.

Books Recommended

1. Guidelines for planning Therapeutic diets- C.Lenka, Akinik Publications, New Delhi
2. Nutrition and Dietetics – Subhangini A.Joshi – Tata McGraw-Hill Publishing Company Limited, New Delhi
3. Dietetics – B.Srilakshmi – New age international (P) limited New Delhi.
4. Clinical Dietetics and Nutrition – F.A. Antia, Oxford University Press, London.
5. Normal and Therapeutic Nutrition- C.H.Robinson, Oxford & IBH publishing Co. Calcutta.

6.Text Book of Human Nutrition- Mahtab S. Bamji, N.Rao & V. Reddy, Oxford & IBH Publishing Co. Pvt Ltd.

7.Essentials of Food and nutrition – M.Swaminathan, Vol I & II, The Bangalore Printing & Publishing Co. Ltd (BAPPCO)

8.Food, Nutrition & Diet Therapy-L.K.Mahan & Escott.Stump- W.B. Saunders Ltd

9.Applied Nutrition & Diet Therapy for Nurses- J Davis, K.Sherer- W.B.Saunders.Co

10.Human Nutrition & Dietetics- J.S.Garrow ,W.P.T.James, A. Ralph –Churhill Livingstone

Course No: HSC. 512 Nutritional Biochemistry 4CH

Objectives:

1.To acquire knowledge on metabolic pathways in the human body for regulation of macro and micro nutrients.

2. To enrich knowledge in digestion, absorption and utilisation of nutrients

Expected Outcome:

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

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

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

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

Unit-IV: Nutritional importance of macro &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 Chaterjee & 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.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 Worth Publishers.
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 Liss inc.

Course No: HSC. 513 Food Microbiology and Food Safety 4CH

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 foods operations to avoid public health hazards due to food contamination.

Expected Outcome:

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

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

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

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

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

Books Recommended:

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

Course No: HSC. 514 Programme Planning In Public Health Nutrition 4CH

Objectives

1. To understand the process of planning, implementation and evaluation of public health nutrition programmes.
2. To understand the concept of nutrition monitoring and nutrition surveillance & to understand the nutritional problems during emergencies / disasters as well as the strategies to tackle them.

Expected Outcomes

Knowledge on programme planning in public health nutrition will help students how to monitor and evaluate nutrition surveillance programmes and strategies to undertake to tackle nutritional problems during emergencies.

Unit I Programme Planning and Management in Public Health Nutrition: Basic principles and models of programme planning, Planning process in public nutrition

Unit II Programme Monitoring And Evaluation: Definition, significance and purpose of monitoring the food and nutrition programmes. Identification and selection of indicators for monitoring, data collection and analysis system (e.g. MIS).Definition, significance and purpose of evaluation in food and nutrition programmes. Principles of evaluation, types, models and steps of evaluation. Identification and selection of indicators for evaluation. Strategies for data collection (qualitative and quantitative)

Unit III Nutritional Surveillance: Objectives, initial assessment indicators for use in nutritional surveillance, Nutritional surveillance for programme planning, Triple A approach, Current program monitoring system in India.

Unit IV: Nutrition In Emergencies And Disasters: Natural and manmade disasters resulting in emergency situations. Nutritional problems in emergencies in vulnerable groups,Macro and micronutrient deficiencies, Infection. Assessment and surveillance of affected population groups – clinical, anthropometric and dietary, utritional relief and rehabilitation – assessment of food needs, food distribution strategy, mass and supplementary feeding, sanitation and hygiene, evaluation of feeding programmes , Public nutrition approach to tackle nutritional problems in emergencies.

Books Recommended:

1. Edelstein S. (2006) Nutrition in Public Health. A handbook for developing programmes and services. Second Edition. Jones and Bartlett Publishers.
2. Goyet, Fish. V. Seaman, J. and Geijer, U. (1978) The Management of Nutritional Emergencies in Large Populations, World Health Organization, Geneva.
3. FAO. (1983) Selecting Interventions for Nutrition Improvement. A Manual Nutrition in Agriculture. No. 3.
4. Gibney M.J., Margetts, B.M., Kearney, J. M. Arab, I., (Eds) (2004) Public Health Nutrition, NS Blackwell Publishing.
5. Klein, R. E. (Ed) (1979) Evaluating the Impact of Nutrition and Health Programmes. London and New York: Plenum Press.
6. Owen. A. Y. and Frankle, R. T. (1986) Nutrition in the Community. The Art of Delivering Services, 2nd ed. Times Mirror/ Mosby.
7. WFP/ UNHCR (1998) WEP/ UNHCR Guidelines for Selective Feeding Programmes in Emergency Situations. Rome and Geneva: WEP & UNHCR.
8. Nutrition Science – B.Srilakshmi, New Age international (P) Limited, New Delhi.
9. Food processing and Preservation – G. Subhalakshmi & Shobha A. Udipi, New Age International (P) Limited, New Delhi.
10. Food Hygiene & Sanitation – S.Roday- Tata McGraw Hill, New Delhi.

Course No: HSC. 515 Practical related to all the theory papers 2CH

To be decided by the teachers council of the department

Course No: HSC. 516 Dissertation 2CH

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

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

FOURTH SEMESTER

Course No: HSC. 521: Public Health Nutrition 4CH

Objectives

1. To understand the concept of public 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 And Health Care System: Aim, scope and content of public health nutrition. Currents concerns in Public Health Nutrition. Health – definition, dimensions, determinants, indicators, Community Health Care, National Health Care Delivery System

Unit II: Health Economics and Economics of Malnutrition – impact on productivity and national development. Enhancing quality of life through Nutrition Education (Methods, Teaching Aids & Mass communication Media).

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

Unit IV Approaches/ Strategies for Improving nutrition status and health status of the community: Health based interventions including immunization, provision of safe drinking water/ sanitation, prevention and management of diarrhoeal diseases. Food based interventions including food fortification, dietary diversification, supplementary feeding and biotechnological approaches. Education based interventions including growth monitoring and promotion (GMP), health/ nutrition related behaviour change communication.

Books Recommended:

1. Achaya, K.T. (Ed) (1984) Interface Between Agriculture, Nutrition and Food Science,
2. Beaton, G. H and Bengoa, J. M. (Eds) (1996) Nutrition in Preventive Medicine, WHO.
3. Gibney M.J., Margetts, B.M., Kearney, J. M. Arab, I., (Eds) (2004) Public Health Nutrition, NS Blackwell Publishing.
4. Gopalan, C. (Ed) (1987) Combating Under nutrition – Basic Issues and Practical Approaches, Nutrition Foundation of India.
5. Kaufman M. (2007) Nutrition in promoting the public health strategies, principles and practice. Jones and Bartlett Publishers.
6. Park, K. (2009) Park's Textbook of Preventive and Social Medicine, 20th ed. Jabalpur M/s. Banarsidas Bhanot.
7. Food Facts and Principles -N. Shakuntala Manay & M. Shadaksharaswamy, New Age International (P)

8. Nutrition Science – B.Srilakshmi, New Age international (P) Limited, New Delhi.
9. Food Hygiene & Sanitation – S.Roday- Tata McGraw Hill, New Delhi.
10. Essentials of Food and nutrition – M.Swaminathan, Vol I & II, The Bangalore Printing & Publishing Co. Ltd (BAPPCO)

Course No: HSC 522: Public Health Aspects Of Malnutrition **4CH**

Objectives
1. To understand the principles of nutritional epidemiology and its importance in public health
2. To understand the prevalence and determinants of community's nutritional/ health problems.
To learn about the public health implications of various nutritional problems and the strategies to overcome the same.
Expected Outcome:
Studies on public health aspects of Mal-nutrition will prepare students to handle different health problems at community level such as under-nutrition, SAM & lifestyle disorders.

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

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

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

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

Books Recommended:

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

HSC 523: Advanced Clinical Nutrition 4CH

Objectives

1.To understand the effect of various disorders / diseases on nutritional status, nutritional and dietary requirements.
2.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 Nutrition Care In Stress: Diet, Nutrient and Drug interactions. Nutrition Support – Parenteral Nutrition, diagnosis, complications, treatment, and dietary counselling in Metabolic Stress -Surgery, Burns, Sepsis & Trauma .

Unit II Diseases of Heart and Blood Vessels : Etiopathophysiology, diagnosis, complications and recent advances in prevention, treatment, MNT and dietary counselling in Myocardial Infarction, Congestive Heart failure Coronary Bypass Surgery..

Unit III Nutrition in Cancer- Risk factors symptoms, general systematic reactions, Nutritional problems in cancer therapy, Nutritional requirements, Dietary management & role of food in prevention of cancer.

Unit IV Nutrition in HIV and AIDS- Current status of HIV & AIDS in India, relation of nutritional status & HIVor AIDS, Opportunistic Infections(OI), Anti Retro Viral Drugs(ARV's), Mother-to- Child transmission & Paediatric Aids care & Nutrition in HIV.

Books Recommended:

1. Mahan, L. K. and Escott Stump. S. (2008) Krause's Food& Nutrition Therapy 12th ed. Saunders-Elsevier Shils, M.E., Shike, M, Ross, A.C., Caballero B and Cousins RJ (2005). Modern Nutrition in Health and Disease. 10th ed. Lipincott, William and Wilkins. Gibney MJ, Elia M, Ljungqvist &Dowsett J. (2005)
2. Clinical Nutrition. The Nutrition Society Textbook Series. Blackwell Publishing Company Garrow, J.S., James, W.P.T. and Ralph, A. (2000)
3. Human Nutrition and Dietetics. 10th ed. Churchill Livingstone.
4. Nutrition & Dietetics- Subhangini Joshi, McGraw Hill Education (India) Pvt. Ltd.
5. Kaufman M. (2007) Nutrition in promoting the public health strategies, principles and practice. Jones and Bartlett Publishers.
6. Park, K. (2009) Park's Textbook of Preventive and Social Medicine, 20th ed. Jabalpur M/s. Banarsidas Bhanot.
7. Nutrition Science – B.Srilakshmi, New Age international (P) Limited, New Delhi.
8. Essentials of Food and nutrition – M.Swaminathan, Vol I & II, The Bangalore Printing & Publishing Co. Ltd (BAPPCO)
9. Dietetics – B.Srilakshmi, New Age international (P) Limited, New Delhi.

HSC 524: Entrepreneurship In Food Service 4CH

Objectives

1.To develop a knowledge base about the physical facilities needed for different types of food service units & to impart necessary expertise to manage the financial aspects in the units.
2.To help develop marketing strategies & to equip individuals to start their own food service unit as Entrepreneurs.

Expected Outcome:

At the end of the course student will gain knowledge on different aspects of entrepreneurship in food service unit and able to start their own food service unit.

Unit I Entrepreneurship Development**:** Entrepreneur**,** Entrepreneurship**,** Capacity building through Training:- Meaning, definition, importance & need of training, education vs training, setting training objective, training need assessment (TNA).

Unit II Marketing & Sales Strategies- Product Differentiation, Marketing Techniques & strategies, Sales Management. Importance of financial management in a food based enterprise. Budgets & Budgeting process, maintaining records (menu, purchase, store, production, sale & personal utility), books of accounts(Journal, sales return books, purchase return book, sales book, purchase book, cash book & ledger), Pricing and its methods (Costing, concepts and controlling techniques, cost effective procedures) & Reports(Cost analysis, concept of trial balance, Profit & Loss account).

Unit III Food Hygiene Sanitation and Safety**-** Importance of hygiene and sanitation in food service units**,** Sanitation measures for Food, Personnel and Unit Hygiene, Training techniques for food service personnel in Sanitation. Safety- causes of accidents, types, safety techniques, 3 Es of Safety**.**

Unit IV Establishment and Operations of a Food Based Enterprise, Conceptualizing the Enterprise(Survey of types of units, consumer needs , identifying clientele, menu, operations and delivery).Planning the set up: Identifying resources(Facility available and equipments needed, Menu and precosting, Manpower required, Utilities)Developing Project plan and Determining investments, Feasibility assessment. Operationalising the unit(Procedures for menu planning, purchase, production and delivery of product). Evaluation of the working of unit (Food cost analysis, Sales analysis, Profit and loss statement, Balance sheet.

Books Recommended:

1. West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised By Hargar FV, Shuggart SG, & Palgne Palacio June, Macmillian Publishing Company New York.
2. Sethi Mohini (2005) Institution Food Management New Age International Publishers.
3. Kazarian E A (1977) Food Service facilities Planning 3rd Edition Von Nostrand Reinhold New York.
4. Kotas Richard & Jayawardardene. C (1994) Profitble Food and Beverage Management Hodder & Stoughton Publications.
5. Taneja S and Gupta SL (2001) Entrepreneurship development, Galgotia Publishing.
6. Catering Management in the Technological age-Fuller Barrievd- Rock hiff Publications.
7. Personal Management in the Hotel& Catering Industries- Boella- Hutchinson Publications.
8. Food Service Systems & Administration- Hitchcock Macmillan Publication.
9. Hotel House Keeping Training Manual- Andrews Snoher-Tata McGraw Hill Publication-New Delhi.
10. The Practice of Hospitality Management _vol I and II –R.Lewis, T.Begg's M.Shaw & S.Croffot-AVI Publishing Co.DC.West Port Connecticut.

Objectives

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

Expected Outcome:

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

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

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

Unit III: Milk and milk products technology: Milk- composition, factors affecting milk quality, physical and chemical properties. Milk processing: Separation, centrifugal process, natural creaming, pasteurization, sterilization, homogenization, effect of processing on nutritive value. 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.

RECOMMENDED READINGS

1. Siddapa, G S(1986) Preservation of Fruits and Vegetables, ICAR PublicationVan Loesecke HW (1998),
2. Food Technology Series Drying and Dehydration of foods. Allie Scientific Publishers.
3. Salikhe D K and Kadam S S(1995), Handbook of fruit science and technology.
4. Production Composition, Storage and processing. Marcel Decker inc, New York.
5. Marriott N G (1985), Principles of Food Sanitation 1st Edition. A VI publication USA. De Su Kumar, Milk and milk 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 No: HSC. 526 Dissertation 6CH

Each student has to carry out the dissertation work immediately after registration in the Third Semester and submit the final dissertation containing Introduction, Literature review, objectives, Hypothesis, Methodology, Result & discussion, summary, conclusion, recommendation references etc for evaluation by one internal & one external examiner in the end of Fourth Semester. The candidate has to submit two copies and a soft copy of the final dissertation to the head of the department. The H.O.D will forward the dissertation to the examiner for evaluation. The valuation of dissertation shall be followed by an open Viva voce. In the final dissertation evaluation (6CH), 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 examiners.

Course No: HSC. 527 Seminar 2CH