ALAGAPPA UNIVERSITY

(A State University Accredited with 'A+ Grade by NAAC (CGPA: 3.64) in the third cycle)

Karaikudi – 630 003, Tamilnadu, India

DIRECTORATE OF DISTANCE EDUCATION

PROGRAMME PROJECT REPORT

Programme Code: 365

M.Sc., HOME SCIENCE - NUTRITION AND DIETETICS

REGULATIONS AND SYLLABUS

[From the academic year 2018-2019 onwards]

Credit Based System

(a) PROGRAMME'S MISSION & OBJECTIVES

- To provide scientifically planned, multi-dimensional, skill oriented and personality development course, which will enable the students to excel in today's context.
- To provide education not only to acquire knowledge but also to inculcate a sound philosophy for holistic living.
- To educate students towards independence and equality by inculcating a sense of self-worth, integrity and purpose.
- To empower students to respond creatively and with a sense of responsibility to the contemporary needs of the society.
- To provide quality education and at the same time inculcate a spirit of service and dedication.
- To build competent professional Nutrition & Dieticians in hospitals and specialty clinics. Thereby, the professionals can find job prospects in the field as Nutrition and Diet consultants in Food service organizations like Hotels, Hospitality services, Geriatric homes and also as administrators of Industrial canteens and other specialties.

(b) RELEVANCE OF THE PROGRAM WITH HEI'S MISSION AND GOALS

Through this program offered, the HEI will prepare students to do the learning activities independently, gaining knowledge and skills in nutrition & dietetics, and applying the knowledge they have acquired for the welfare of human.

The HEI's mission is "Affording a High Quality Higher Education to the learners so that they are transformed into intellectually competent human resources that will help in the upliftment of the Nation to Educational, Social, Technological, Environmental and Economic Magnificence".

The curriculum and syllabus, of M.Sc., Home Science - Nutrition and Dietetics course at Alagappa University, have been designed to encompass basic as well as applied knowledge of Nutrition and Dietetics to produce ready and employable Home Science postgraduates capable of availing promising professional carrier in life.

(c) NATURE OF PROSPECTIVE TARGET GROUP OF LEARNERS

The target group of learners for admission to the M.Sc., Home Science - Nutrition and Dietetics shall be graduates of a Bachelor's degree from a recognized university with minimum 55% marks in Home Science, Botany, Zoology, Biochemistry, Chemistry, Biotechnology, Microbiology, Food Science and Quality Control and Clinical Nutrition and Dietetics, M.B.B.S./ B.H.M.S./ B.A.M.S./ B. Pharmacy and any other relevant subjects in Science. The target group of learners apart from minimum prescribed qualifications is Working Professionals, Entrepreneurs, Service Personnel, Academic Faculty, Government Officials, Researchers, Home Makers and Unemployed Graduates.

(d) APPROPRIATENESS OF PROGRAMME TO BE CONDUCTED IN OPEN AND DISTANCE LEARNING MODE TO ACQUIRE SPECIFIC SKILLS AND COMPETENCE

Open and Distance Learning of M.Sc. Home Science - Nutrition and Dietetics will improve skills of the learners either in job or their pre-jobs requirements. There is a great importance and relevance in countries like India where there is an urgent need of providing, cost effective training in the field of Home Science -nutrition and dietetics to a large number of untrained work forces and need of continuing education at different levels. Thereby, the professional open and distance mode learning will improve overall knowledge of the learners and enable them to be part of the productive force in the management of quality of life in India. Through the M.Sc. Home Science - Nutrition and Dietetics program, the students will obtain knowledge in Human Physiology, Health and Nutrition, Advanced food science, Nutritional Biochemistry, Food service management, Clinical and therapeutic nutrition, Dietetics in life style diseases, Paediatric nutrition, Food microbiology and biotechnology. Over all, the course will enhance the performance of students in the field of Nutrition and Dietetics.

(e) INSTRUCTIONAL DESIGN

M.Sc., HOME SCIENCE – NUTRITION AND DIETETICS

Sl. No.	Course Code	TITLE OF THE COURSE	CIA Max.	ESE Max.	TOT Max.	C
		FIRST YEAR				
		I Semester				
1	36511	HUMAN PHYSIOLOGY	25	75	100	4
2	36512	NUTRITION AND HEALTH	25	75	100	4
3	36513	ADVANCED FOOD SCIENCE	25	75	100	4
4	36514	Lab. I: HUMAN PHYSIOLOGY, NUTRITION AND HEALTH & ADVANCED FOOD SCIENCE	25	75	100	4
		Total	**100**	**300**	**400**	**16**
		II Semester				
5	36521	NUTRITIONAL BIOCHEMISTRY	25	75	100	4
6	36522	FUNCTIONAL FOODS AND NUTRACEUTICALS	25	75	100	4
7	36523	FOOD SERVICE MANAGEMENT	25	75	100	4
8	36524	Lab. II: NUTRITIONAL BIOCHEMISTRY, FUNCTIONAL FOODS AND NUTRACEUTICALS & FOOD SERVICE MANAGEMENT	25	75	100	4
		Total	**100**	**300**	**400**	**16**
		SECOND YEAR				
		III Semester				
9	36531	CLINICAL AND THERAPEUTIC NUTRITION	25	75	100	4
10	36532	DIETETICS IN LIFE STYLE DISEASES	25	75	100	4
11	36533	COMMUNITY NUTRITION	25	75	100	4
12	36534	Lab. III: CLINICAL AND THERAPEUTIC NUTRITION, DIETETICS IN LIFE STYLE DISEASES, COMMUNITY NUTRITION	25	75	100	4
		Total	**100**	**300**	**400**	**16**
		IV Semester				
13	36541	PAEDIATRIC NUTRITION	25	75	100	4
14	36542	FOOD MICROBIOLOGY AND SANITATION	25	75	100	4
15	36543	FOOD BIOTECHNOLOGY & BIOSTATISTICS	25	75	100	4
16	36544	Lab. IV: PAEDIATRIC NUTRITION, FOOD MICROBIOLOGY AND SANITATION & FOOD BIOTECHNOLOGY & BIOSTATISTICS	25	75	100	4
		Total	**100**	**300**	**400**	**16**
		Grand Total	**400**	**1200**	**1600**	**64**

Course Code Legend:

3	6	5	Y	Z

365- M.Sc., HOME SCIENCE - NUTRITION AND DIETETICS

Y -Semester Number

Z- Course Number in the Semester.

CIA: Continuous Internal Assessment, ESE: End Semester Examination, TOT: Total, C: Credit Points, Max.: Maximum

36511-HUMAN PHYSIOLOGY	
Maximum marks: 100	**Credits: 4**

Objectives:

To enable the students

- To understand the basic concepts of prokaryotic and eukaryotic cell.
- To understand the basics of Human Physiology.
- To enable the students to understand the metabolic changes under various conditions.

BLOCK – I: CELL, CELL ORGANELLES, TISSUES AND MUSCLES

Unit I

Cell - Structure and organization of prokaryotic and eukaryotic cells. Cell and nuclear membrane, cell wall and cell envelope. Physiology of cytoplasm.

Unit II

Cell organelles - Structural organization and functions of intracellular organelles: nucleus, nucleolus, endoplasmic reticulum, golgi complex, mitochondria, chloroplast, lysosomes, peroxisomes and vacuoles.

Unit III

Tissues - Classification, structure and functions of epithelial, muscular, connective and nervous tissues.

Unit IV

Musculo skeletal system – structure and functions of bone, cartilage, muscle, joints, ligaments and tendons.

BLOCK – II: BLOOD, CARDIOVASCULAR, RESPIRATORY AND DIGESTIVE SYSTEM

UNIT V

Blood - Introduction to hematology, functions of blood, plasma proteins, erythrocytes, Hb, important indices of RBC & WBC, Functions of blood groups, ESR, blood viscosity, blood coagulation, Erythroblastosis foetalis and blood transfusion.

UNIT VI

Cardiovascular system - Basic properties of the heart, cardiac output, blood pressure and factors affecting it and hypertension. Nutrition and metabolism of heart. Exercise and heart Function. Techniques to identify cardiovascular disorders –angioplasty and angiogram.

UNIT VII

Respiratory system - Anatomy and physiology of respiratory organs, mechanism of respiration, gaseous exchange in lungs and tissues. Resuscitation and its methods. Respiratory disorders: dyspnoea, asphyxia, hyperpnoea, orthopnoea,

UNIT VIII

Digestive system - Anatomy, composition & functions of salivary, gastric, intestinal & pancreatic secretions. Functions of bile salts, Mechanism of secretion of digestive juices and its regulation, movements of stomach, small intestine, villi, defecation. Important of liver in digestive system, anatomy and physiology.

BLOCK – III: EXCRETORY AND REPRODUCTIVE SYSTEM, SENSE ORGANS

UNIT IX

Excretory system - Mechanism of urine formation and the role of the kidneys in water and electrolyte balance. Renal function tests. Artificial kidney, dialysis and renal transplantation.

Unit X

Reproductive system - Male and female reproductive organs: structure and functions. Menstruation, menstrual cycle, puberty, menarche, menopause, fertilization, conception, implantation. Male and female contraception's- Etiology of male and female infertility.

Unit XI

Sense organs - Physiology of vision, hearing, taste, smell and cutaneous sensations.

BLOCK – IV: ENDOCRINE, EXOCRINE AND NERVOUS SYSTEM

Unit XII

Endocrine glands - pituitary, thyroid gland, parathyroid gland, pancreas, adrenal cortex and adrenal medulla. Mechanism of action of hormones. Hormonal imbalance syndromes, hypo or hyperactivity.

Unit XIII

Exocrine glands – Structure and functions of sweat, salivary, mammary, ceruminous, lacrimal, sebaceous, and mucous glands. Gland secretion syndromes.

UNIT XIV

Nervous system - General anatomy of nervous system, functions of the different parts, reflexes, autonomic nervous system. Common test in neurological disorders- EEG, EMG, MRI, NCV.

REFERENCES

1. Leslie P. Gartner, 2016. "Textbook of Histology" Elsevier; 4th edition.
2. John E. Hall, 2015. "Guyton and Hall Textbook of Medical Physiology" W.B. Saunders & Company 13th edition.
3. Tortora G.J and Grabowski S.R, 2000. "Principles of Anatomy and Physiology". John Wiley and Sons.Inc. 9th edition.
4. Chaudhari S. K, 2000. "Concise Medical Physiology"3rd Edition.
5. West J.B. 1996. "Physiological Basis of Medical Practice". B. I. Waverly Pvt. Ltd. 12th Edition.
6. Guyton.A.C, 1991. Textbook of medical physiology, 9th edition, Philadelphia, WB Saunders.
7. Chattergee.C.C, 1987. Human Physiology (11th edition), Vol 1 & 2, Medical Allied Physiology.

OUTCOME:

This course provides the students a sound basis in human physiology to support further study in health nutrition & dietetics and medical sciences or related fields.

----------**********----------

36512- NUTRITION AND HEALTH	
Maximum marks: 100	**Credits: 4**

Objectives:

To enable the students

- To understand the role of nutrition in different conditions.
- To examine the techniques available for the assessment of nutritional status.
- To provide a complete understanding of the links between early nutrition and adult disease.
- To identify and overcome obstacles in the provision of healthy diets for specific age groups.
- To develop competency in planning diets to meet the nutritional requirements of different socio economic levels.

BLOCK – I: NUTRITION, DIET IN HEALTH AND PREGNANCY

UNIT I

Nutrition and diet in health - concept of adequate nutrition and malnutrition. Difference between hunger, apetite and satiety. Different food groups – major nutrients present in each group, guide in menu planning.

UNIT II

Recommended dietary allowances - Basis for requirements. ICMR Recommended Dietary Allowances (RDA) for Indians, FDA Recommendations, Basal metabolic rate (BMR) and active metabolic rate (AMR). Balanced diets.

UNIT III

Nutrition in pregnancy - Physiological changes in pregnancy. Nutritional status and general health. Importance of preconceptual nutrition. Weight gain during pregnancy and the nature of weight gain. Factors affecting maternal nutritional status.

UNIT IV

Nutrition in pregnancy - requirements, storage of nutrients in normal pregnancy, complications of pregnancy and nutritional problems in young and too old expectant mothers – causes and complications. Avoiding pregnancy associated health risk through nutrition- gestational diabetes, iron deficiency anemia and hypertensive disorders.

BLOCK–II: VACCINATION, NUTRITION IN LACTATION, INFANCY AND PRESCHOOL

UNIT V

Pregnancy and vaccination -Immunization schedule & tests during pregnancy - measles, mumps, rubella (MMR) vaccine- Tdap vaccine.

UNIT VI

Nutrition in lactation - Physiological adjustments during lactation, lactation in relation to growth and health of infants, efficiency of milk production, diet during lactation.

UNIT VII

Nutrition in infancy - Nutritional status of the infants, rate of growth as the indicator. Nutritional allowances for the infants, breast feeding Vs formula feeding, food square, weaning foods suitable for infants, feeding the premature infants and Low Birth Weight (LBW) infants, reasons for under 5 Mortality Rate (MR), interventions to prevent malnutrition.

UNIT VIII

Nutrition in preschool age - Growth and development of preschool children, food habits and nutrient intake of preschool children. Dietary allowances – supplementary foods, reasons for under 5 Mortality Rate. Interventions to prevent malnutrition among preschoolers.

BLOCK–III: NUTRITION IN SCHOOL AGE, ADOLESCENCE AND ADULTS

UNIT IX

Nutrition during school age - Physical development, nutritional status of school going children, food habits, nutritional requirements, nutrition and academic performance, interventions to prevent malnutrition.

UNIT X

Nutrition during adolescence - Changes of growth, assessment of growth – sexual maturity rating, physical, physiological and psychological changes in adolescents. Nutritional needs of the adolescents, changes needed to prevent malnutrition in adolescents.

UNIT XI

Nutrition for the adults - Nutritional requirements according to the mode of activity. Nutrition and health of women-general nutritional problems of women, anemia, osteoporosis, pre and post-menopausal syndrome, hormonal changes during menopause. Infertility – risk factors, prevention, methods of detection.

BLOCK–IV: NUTRITION IN OLD AGE, SPECIAL EVENTS AND NUTRITION MONITORING

UNIT XII

Nutrition in old age - Ageing process - physiological, metabolic, body composition changes. Nutritional & health status of elderly.

UNIT XIII

Nutrition in special events - Sports nutrition - quantity of fluids and food taken by an athlete. Space nutrition - food product created and processed for consumption by astronauts in outer space.

UNIT XIV

Nutrition monitoring and its current programmes - Nutrition Surveillance System, Integrated Child Development Services (ICDS) Programme, Nutrient Deficiency Control Programme, Supplementary Feeding Programme and Food Security Programme.

REFERENCES

1. L. Kathleen Mahan and Janice L. Raymond, 2016. Krause's Food & the Nutrition Care Process Saunders-Elsevier.
2. Park.K, 2015. Park's Textbook of Preventive and Social Medicine, 23rd ed. M/s Banarsida Bhanot, Jabalpur.
3. William's, 2009. Basic Nutrition and Diet Therapy. 13th Edition. Stacy Nix, Elsevier Mosby.
4. Tony Worsley, Basil S. Hetzel and Mark Lawrence, 2008. Public Health Nutrition: From Principles to Practice. Allen and Unwin Special Priced Titles.
5. Mahan.L.K and Stump SE, 2001. Krause's Food, Nutrition and Diet Therapy, WB Saunders Company, 10^{th} edition.
6. FAO/WHO, 1998. Preparation and use of food based dietary guidelines. Report of a joint FAO/WHO consultation: Nicosia, Cyprus. Nutrition Programme, WHO, Geneva.

OUTCOME:

This course enables the students to understand the social relevance of nutrition and its role in health.

----------**********----------

36513 - ADVANCED FOOD SCIENCE	
Maximum marks: 100	**Credits: 4**

Objectives:

To enable the students

- To understand the nutritive value of foods.
- To understand the principles and chemistry of foods.
- To examine how food quality, properties, and safety are affected and controlled by handling, processing and storage practices.

BLOCK-I: FOOD PREPARATION, PROPERTIES OF FOOD AND FOOD QUALITY

UNIT I

Food in relation to health - Introduction to food science as a discipline and modern developments, different methods of cooking, functions of cooking food.

UNIT II

Functional properties of foods - Definition, structure and properties of food hydrocolloids. Hydrocolloids as gelling, emulsifying, thickening, stabilizing and coating agents. Important roles of proteins (denaturation and browning), carbohydrates (caramelization and crystallization) and fats (emulsification) in altering the functional properties of food.

UNIT III

Evaluation of food quality - Quality attributes of food – appearance factors, textural factors, and flavor factors sense of taste, texture and colour: sensory evaluation and objective evaluation. Types of sensory test. Procedures for determination and monitoring of shelf life.

BLOCK-II: CEREALS, MILLETS, PULSES, NUTS, VEGETABLES, FRUITS AND FLESH FOOD

UNIT IV

Cereals & Millets - Nutritive value, parboiling, Cereal cookery – gluten- factors affecting gluten formation, Starch granules structure and characteristics – effect of moist and dry heat, nonstarch polysaccharides- fibres, cellulose, hemicellulose, pectic substances, gums and carboxy methyl cellulose (CMC). Nutritive value of breakfast cereals and fermented products.

UNIT V

Pulses, nuts and oilseeds - Nutritive value, processing, protein foods for infants and children, soy products, protein concentrates and isolates, textured vegetable proteins.

UNIT VI

Vegetables and fruits - Nutritional importance, pigments and acids, effect of cooking on pigments and nutrients. Post-harvest changes of fruits, browning reactions- enzymatic and non-enzymatic.

UNIT VII

Flesh foods - Composition, post-mortem changes in meat, changes produced during cooking, spoilage. Effect of heat on egg proteins, egg foams, factors influencing foaming and egg products.

BLOCK-III: MARINE FOODS, MILK PRODUCTS, FATS AND BEVERAGES

Unit VIII

Nutritive value of marine foods: Fish, shrimp and sea weeds.

Unit IX

Milk and milk products – Nutritive value of milk powders, ghee, khoa, butter, paneer, cheese and ice creams - Composition, physical and functional properties.

UNIT X

Fats and oils - role of fat in cookery, rancidity, changes of fat on heating, salad dressing.

UNIT XI

Beverages – Classification, manufacture and nutritional significance and energy value.

BLOCK-III: SUGAR, FOOD ADDITIVES AND FOOD TECHNOLOGY

UNIT XII

Sugar - Properties, sugar related products, crystallization, crystalline & non- crystalline candies, stages of sugar cookery, artificial sweeteners.

Unit XIII

Food additives - Definition and needs for food additives, types of food additives and food safety, unintentional additives.

UNIT XIV

Food technology - Genetically Modified (GM) foods, Production and nutritive value of GM foods.

REFERENCES

1. Judith L. Buttriss, Ailsa A. Welch, John M. Kearney, Susan A, 2017. Lanham-New. Public Health Nutrition, 2nd Edition, ISBN: 978-1-118-66097-3.
2. B. Srilakshmi, 2015. "Food Science" New Age International Private Limited; Sixth edition.
3. Frank Lee, 2012. "Basic Food Chemistry" Springer; Softcover reprint of the original 1st edition.
4. Sunetra Roday, 2012. "Food Science and Nutrition" Oxford Press; Second edition.
5. G. L. Tandon, G. S. Siddappa, Girdhari Lal, 2009. "Preservation of Fruits and Vegetables" by Bombay Popular Prakashan.
6. Manay.N.S & Shadaksharaswamy.M, 2002. Foods-Facts & Principles. New Age International Pvt.Ltd, New Delhi.
7. Potter, N. Hotchkiss, H.J, 1996. Food Science, 5th edition, CBS publishers and distributers, New Delhi.
8. Beckhan. C.G & Graves.H.J, 1979. Foundations of food preparations, Macmillan Publishing Co, New Delhi.

OUTCOME:

This course facilitates the students to understand the basic concepts in food science

----------**********----------

36514 - Lab. I: HUMAN PHYSIOLOGY, NUTRITION AND HEALTH & ADVANCED FOOD SCIENCE	
Maximum marks: 100	**Credits: 4**

Objectives:

To enable the students

- ✓ To assessment of nutritional status and nutritional requirements of humans.
- ✓ To planning and preparation of therapeutic diets for various diseases and health conditions.
- ✓ To introduce the students about the tools used in health management.

HUMAN PHYSIOLOGY

1. Estimation of Glucose from blood.
2. Analysis of blood Haemoglobin.
3. Determination of Cholesterol from blood.
4. Estimation of Vitamins, Minerals, Electrolytes from blood.
5. Blood cell counts, haematocrit, blood histology/ blood smears
6. Blood typing
7. Histology: cells and tissues
8. Diffusion and osmosis
9. Urine analysis - Creatinine, Total nitrogen and Urea
10. Pregnancy test

HEALTH AND NUTRITION

1. Preparation of low cost recipes for adolescents, pregnant and lactating mothers.
2. Evaluation of the ongoing public health nutrition programmes.

ADVANCED FOOD SCIENCE

1. Database management of anthropometric indices, biochemical indices, dietary recall, energy expenditure and intake.
2. Role of portable devices in diet and health management.

REFERENCE:

1. Judith L. Buttriss, Ailsa A. Welch, John M. Kearney, Susan A. Lanham, 2017. New. Public Health Nutrition, 2nd Edition, , ISBN: 978-1-118-66097-3.
2. Paul. S., 2014. Textbook of Bio-Nutrition, Curing diseases through diet, CBS publications, first edition.
3. Maurice E Shils, James A. Olson, Moshe Shike, 2012. "Modern Nutrition in health and disease" 11th edition, Vol I & II Lea & Febiger Philadelphia, A Waverly company.
4. Srilakshmi B., 2004. Dietetics, New Age International (P) Limited Publications.
5. Sue Rodwell Williams, Eleanor D. Schlenker, 2003. "Essentials of Nutrition and Diet Therapy" C.V. Melskey Co.
6. M. Swaminathan. 2001. "Principles of Nutrition and Dietetics", Bappeo 88, Mysore Road, Bangalore - 560 018.

----------**********----------

36521 - NUTRITIONAL BIOCHEMISTRY	
Maximum marks: 100	**Credits: 4**

Objectives:

To enable students to:

- ✓ To learn the biochemical role of nutrients in foods and deficiency diseases.
- ✓ To understand the metabolism of nutrients in health and diseases.

BLOCK-I: CARBOHYDRATES AND PROTEINS

Unit I

Carbohydrates - Classification, physical and chemical properties, sources, biological role.

Unit II

Carbohydrate metabolism - Glycolytic pathway, deficiency diseases, inborn errors of carbohydrate metabolism. Nutritional aspects of carbohydrate.

Unit III

Proteins - Classification, physical and chemical properties, sources, biological role and value of protein.

Unit IV

Protein metabolism – Protein synthesis, deficiency diseases and inborn errors of protein metabolism.

BLOCK-II: LIPIDS, VITAMINS AND MINERALS

Unit V

Lipids - Classification, physical and chemical properties, sources, biological role.

Unit VI

Lipid metabolism – β-oxidation. nutritional aspects of lipids, lipid based metabolic diseases, In-born errors of lipid metabolism.

Unit VII

Vitamins - Classification, characteristics, role of vitamins in metabolism, deficiency diseases.

Unit VIII

Minerals - Types, absorption & role of minerals in metabolism, minerals deficiency diseases.

BLOCK-III: NUCLEIC ACIDS AND ENZYMES

Unit IX

Nucleic acids - DNA & RNA, structure, function and metabolism, genetic disorders.

Unit X

Enzymes - Classification, nomenclature, mechanism of enzyme action, enzyme specificity, application of enzymes in clinical diagnosis.

Unit XI

Enzyme activity - Factors affecting enzyme activity, Co- enzymes and Co-factors.

BLOCK-IV: HORMONES, BUFFERS AND ELECTROLYTES

Unit XII

Hormones - Role of hormones. Interrelation between hormones and nutrients. Hormone deficiency diseases.

Unit XIII

Acid base balance - normal health, major sources of acid produced in the body, buffers, physiological role of different buffer systems.

Unit XIV

Fluid and electrolyte balance - Maintenance in normal health. Diseases of electrolytes imbalance. Role of nutrients in maintenance of fluid and electrolyte balance during disease condition.

REFERENCE:

1. Pooja Gupta. (2017) Food, Nutrition And Health, S Chand Publishing, India
2. Berg JM, Tymoczko JL and Stryer L. (2015) Biochemistry 8th ed. W.H. Freeman.
3. Murray RK, Granner DK, Mayes PA and Rodwell VW, (2015) Harper's Illustrated Biochemistry, 30th ed. McGraw-Hill (Asia).
4. Devlin Tm. (2010) Text Book of Biochemistry with clinical Correlations. 7th ed. John Wiley and sons.
5. Voet D and Voet JG. (2010) Biochemistry 4rd ed. John Wiley and Sons.
6. Nelson DL and Cox MM. (2005) Principles of Biochemistry, 4th ed. Freeman and Company.

OUTCOME:

This course provide the students a comprehensive overview about the principle, scope and applications in nutritional biochemistry

----------**********----------

36522 - FUNCTIONAL FOODS AND NUTRACEUTICALS	
Maximum marks: 100	**Credits: 4**

Objectives:

To enable the students

- ✓ To gain knowledge about functional foods and nutraceuticals
- ✓ To understand about the health effects
- ✓ To know the application in Industry.

BLOCK-I: FUNCTIONAL FOODS, PROBIOTICS AND PREBIOTICS

UNIT I

Definition, history, classification of functional foods: Probiotics, prebiotics and synbiotics; Nutrient vs. Non-nutrient.

UNIT II

Probiotics - Taxonomy and important features of probiotic micro- organisms. Health effects of probiotics including mechanism of action.

UNIT III

Probiotic micro- organisms in fermented milk products and non-milk products. Quality assurance of probiotics and safety.

UNIT IV

Prebiotics - chemistry, sources and bioavailability, effect of processing, effects on human health and potential applications in risk reduction of diseases, perspective for food applications for the following:

Non-digestible carbohydrates/oligosaccharides: Dietary fibre, Resistant starch, Gums.

BLOCK-II: PLANT METABOLITES AND NON- NUTRIENT EFFECT OF SPECIFIC NUTRIENTS

UNIT V

Alkaloids, Glucosinolates, Terpenoides and Phenolics- Chemistry, classes, sources, bioavailability and effects on human health

UNIT VI

Antinutrients present in food: phytate, saponin, haemagglutinins, protease, amylase and lipase inhibitors. Spices and Condiments- nutritive value and uses in cooking.

UNIT VII

Non- nutrient effect of specific nutrients: Proteins, Peptides and nucleotides, Conjugated linoleic acid and n-3 fatty acids, Vitamins and Minerals.

BLOCK-III: PROPERTIES, STRUCTURE AND FUNCTIONS OF NUTRACEUTICALS

UNIT VIII

Introduction to nutraceuticals as science - Historical perspective, classification, scope & future prospects.

UNIT IX

Applied aspects of the nutraceutical science**:** Sources of Nutraceuticals. Relation of Nutraceutical Science with other Sciences: Medicine, Human physiology, genetics, food technology, chemistry and nutrition.

UNIT X

Properties, structure and functions of various nutraceuticals - Glucosamine, Octacosanol, Lycopene, Carnitine, Melatonin and Ornithine alpha ketoglutarate. Use of proanthocyanidins, grape products, flaxseed oil as Nutraceuticals.

BLOCK-IV: NUTRACEUTICAL SUPPLEMENTS AND REMEDIES

UNIT XI

Nutraceutical rich supplements - Bee pollen, Caffeine, Green tea, grape tea, wheat grass, Lecithin, Mushroom extract, Chlorophyll, Kelp and Spirulina, *Garcinia cambogia* , *Aloe vera* and Blue Tea4.

UNIT XII

Food as remedies: Nutraceuticals bridging the gap between food and drug, Nutraceuticals in treatment for cognitive disorders. Medicinal plant derived nutraceuticals: Anti aging, anti-inflammatory compounds.

UNIT XIII

Nutraceutical remedies for Arthritis, Bronchitis, circulatory problems, hypoglycemia.

UNIT XIV

Nutraceutical remedies for Nephrological disorders, Liver disorders, Osteoporosis, Psoriasis and Ulcers.

REFERENCES

1. Dhiraj A. Vattem, Vatsala Maitin, 2016. Functional Foods, Nutraceuticals and Natural Products: Concepts and Applications, DEStech Publications, Inc.
2. Joyce I. Boye, 2015. Nutraceutical and Functional Food Processing Technology (IFST Advances in Food Science), Wiley-Blackwell.
3. Cho S. S. and Dreher, M.L, 2001. Handbook Dietary Fibre, Marcel Dekker Inc., New York.
4. Wildman, R.E.C, 2000. Handbook of Nutraceuticals and Functional Foods, CRC Press, Boca Raton.
5. Yurawecz, M.P., M.M. Mossoba, J.K.G. Kramer, M.W. Pariza and G.J. Nelson, 1999. Advances in Conjugated Linoleic Acid Research, Vol. 1. AOCS Press, Champaign.
6. Heller IR, et al. 1999. Report by CSPI. Functional foods: public health boon or 21st century quackery? Washington, DC: Center for Science in the Public Interest.
7. Thomas PL, Earl R, 1994. Opportunities in nutrition and food sciences. Washington, DC: National Academy Press; p 109.

OUTCOME:

This course empowers the students with current scenario in functional foods and neutraceuticals.

----------**********----------

36523 FOOD SERVICE MANAGEMENT	
Maximum marks: 100	**Credits: 4**

Objectives:

To enable the students

- ✓ To understand the objectives of different types of food service Institutions.
- ✓ To apply knowledge in space allocation of food plants
- ✓ To gain knowledge in menu planning preparation of recipes in large scale and serving and in food costing.

BLOCK-I: FOOD SERVICE INDUSTRY, INFRASTRUCTURE AND MATERIALS MANAGEMENT

UNIT I

Food service industry**:** Scope of food industry and segmentation.

UNIT II

Organization & administration of food service industry**:** types, organization structure and management.

UNIT III

Physical facilities and layout – Size and type of kitchen, design of kitchen, ventilation, lighting, flooring, carpets, wall covering and sample layout of kitchen. Storage area and equipment required.

UNIT IV

Food materials management - Purchasing of food materials, receiving & storing – Importance of receiving raw materials.

BLOCK-II: FOOD SERVICE MANAGEMENT IN HOSPITALS

UNIT V

Hospital food production – Menu planning for patients and process of food production. Different methods of holding foods for service.

UNIT VI

Hospital food service management - Principles and techniques of effective management, leadership and managerial abilities.

UNIT VII

Tools of food management - Organizational chart of the food service team in hospital.

UNIT VIII

Food service equipment - Classification, selection, purchasing, care and maintenance.

BLOCK-III: PREPARATION, SERVICE AND SANITATION OF FOOD

UNIT IX

Quantity food preparation - Types of menu, menu planning, purchasing, storage, production management, conventional and non-conventional sources of energy, Standardization and portion control.

UNIT X

Styles of service - Self-service, tray service, waiter-waitress service, vending and mobile food service system.

UNIT XI

Sanitation and hygiene - Environmental hygiene & sanitation, safe food handling practices, personal hygiene.

BLOCK-IV: HUMAN RESOURCE MANAGEMENT, MARKETING AND DIETARY ACCOUNTING

UNIT XII

Human resource management - Recruitment & selection, induction, training, performance appraisal, leadership, communication, employee benefits, laws governing food service establishment.

UNIT XIII

Marketing - Definition, marketing as a managerial function, marketing mix and promotion in food service.

Unit XIV

Dietary accounting - Definition and principles. Journal and ledger. Book of account – cash book, purchase book, sales book, purchase returns & sales returns book.

REFERENCES

1. Karen E. Drummond, Lisa M. Brefere, 2017; Nutrition for Food service and Culinary Professionals, 9th Edition (EHEP003624).
2. Ruby Parker Puckett, 2012. Food service Manual for Health Care Institutions, John Wiley & Sons.
3. Sethi M and Mahan S,, 2006. Catering Management an integrated approach, 2nd edition, John wiley & Sons, New York.
4. Tersel MC and Harger, 2005. Profession food preparation, John wiley & Sons,New York.
5. Joan C Boson, Lennox M. 2004. Hotel, hostel & hospital housekeeping, 5th edition, Book power publishers, New York.
6. Marian C Spears; 1995. Food Service Organisation; III Edition, Prentice Hall Inc., USA.
7. West and Woods, 1994. Introduction to Food Service, Macmillan Publishing Company, New York, 7 th edition.
8. Lendal. H. Kotschever, Richard Donnely, 1993 “Quantity Food Purchasing, Mac Millan Publishing Company, New York, IV Edition.

OUTCOME:

This course imparts the students about the significance of food service management, sanitation of food and dietary accounting.

----------**********----------

36524 - Lab. II: NUTRITIONAL BIOCHEMISTRY, FUNCTIONAL FOODS AND NUTRACEUTICALS & FOOD SERVICE MANAGEMENT	
Maximum marks: 100	**Credits: 4**

Objectives:

To enable the students

- ✓ To gain knowledge in biochemical analysis of food samples.
- ✓ To get practical experience in the laboratory and develop the skills related to functional foods and nutraceuticals.
- ✓ To provide overview about the strategies in food service management.

NUTRITIONAL BIOCHEMISTRY

1. Determination of Moisture content in Food sample.
2. Determination of Carbohydrates, Proteins and fats in Food sample.
3. Determination of Gluten content in wheat.
4. Estimation of Acidity in wheat flour.
5. Estimation of Fiber, Phosphorous and Iron content in any one food.
6. Determination of Calcium content in milk.

FUNCTIONAL FOODS AND NUTRACEUTICALS

1. Manufacturing aspects of selected nutraceuticals (Demonstration)
    a. lycopene,
    b. isoflavonoids
    c. prebiotics
    d. probiotics
    e. glucosamine
    f. phytosterols
2. Spirulina cultivation (Industrial visit)

FOOD SERVICE MANAGEMENT

1. Causes and prevention of food-borne illnesses in food service operations.
2. The levels of management and the various production and service positions in a food operation (Field visits)

REFERENCES

1. Pooja Gupta. (2017) Food, Nutrition And Health, S Chand Publishing, India
2. Paul. S., 2014.Textbook of Bio-Nutrition, Curing diseases through diet, CBS publications, first edition.
3. Maurice E Shils, James A, 2012. Olson, Moshe Shike "Modern Nutrition in health and disease" 11th edition, Vol I & II Lea & Febiger Philadelphia, A Waverly company.
4. Srilakshmi B., 2004. Dietetics, New Age International (P) limited Publications.
5. Sue Rodwell Williams, Eleanor D. Schlenker, 2003. "Essentials of Nutrition and Diet Therapy" C.V. Melskey Co.
6. M. Swaminathan, 2001. "Principles of Nutrition and Dietetics", Bappeo 88, Mysore Road, Bangalore - 560 018.
7. Messina M, Messina V, 1996.Nutritional Implications of Dietary Phytochemicals. In: Dietary Phytochemicals in Cancer Prevention and Treatment. Plenum Press. New York.

----------**********----------

36531 - CLINICAL AND THERAPEUTIC NUTRITION	
Maximum marks: 100	**Credit: 4**

Objectives:

To enable the students to know the

- ✓ Effect and clinical values of various diseases
- ✓ Nutritional status and dietary requirements.

BLOCK-I: ROLE OF DIETITIAN, NUTRITION PSYCHOPATHOLOGY AND HOSPITAL DIETS

UNIT I

Role of dietitian in the hospital and community- Education and personal qualifications, professional ethics and obligations. Educating the patient, diet clinics and follow up.

UNIT II

Psychology of feeding the patient, problems of feeding children, assessment of patient's needs.

UNIT III

Routine hospital diets -Regular diet, light diet, soft diet, full liquid diet, clear liquid diet and tube feeding.

UNIT IV

Enteral and parental feeding in hospitals –composition, monitoring and complications. Transitional feeding.

BLOCK-II: DIET IN FEBRILE CONDITIONS AND GASTROINTESTINAL DISORDERS

UNIT V

Modifications of diet in febrile conditions -Acute, chronic and recurrent fevers, typhoid, rheumatic fever, tuberculosis, malaria, H1N1, dengue fever and chikungunya.

UNIT VI

Gastrointestinal disorders - Esophagitis, cancer of oral cavity, ulcer, indigestion, gastritis, carcinoma of the stomach, gastric surgery and dumping syndrome.

UNIT VII

Gastrointestinal Disorders - Diarrhoea, constipation, flatulence, celiac disease, tropical sprue, steatorrhea.

UNIT VIII

Irritable bowel disease (IBD) – crohn's disease, ulcerative colitis, Irritable bowel syndrome (IBS), diverticulitis, colitis and colon cancer.

BLOCK-III: DIET IN LIVER, GALL BLADDER, PANCREAS, METABOLIC AND RENAL DISORDERS

UNIT IX

Liver, gall bladder and pancreatic disorders - Ecological factors: Dietary regimen in cirrhosis, hepatitis, hepatic coma, cholecystitis, cholelithiasis and pancreatitis

UNIT X

Metabolic disorders - Hypothyroidism, hyperthyroidism, gout, phenylketonuria and lactose intolerance

UNIT XI

Renal disorders - Contributory factors and dietary modification- acute and chronic glomerulonephritis, nephrosis, nephrosclerosis and nephrolithiasis.

BLOCK-IV: DIET IN FOOD ALLERGY, NEUROLOGICAL DISORDERS AND METABOLIC STRESS

UNIT XII

Food allergy - Definition, types, tests, dietary management and prevention.

UNIT XIII

Diet during neurological disorders - Alzheimer's disease, Parkinson's disease and epilepsy.

UNIT XIV

Diet during metabolic stress - Burns, sepsis and trauma. Surgical conditions- Cardiovascular complications, stroke and surgery, respiratory failure, hepatic failure, multi organ failure, Gastrointestinal tract (surgery and complications) and neurosurgery.

REFERENCES

1. Ellen Davis, 2017. Fight Cancer with a Ketogenic Diet: Using a Low-Carb, Fat-Burning Diet as Metabolic Therapy, 3rd edition, Ellen Davis.
2. Sylvia Escott-Stump, 2015. Nutrition and Diagnosis-Related Care. 8th edition, Wolters Kluwer.
3. Mahan.L.K and Stump SE, 2001. Krause's Food, Nutrition and Diet Therapy, WB Saunders Company, 10th edition.
4. Antia FP, Clinical Dietetics and Nutrition, 1997.Oxford University Press, New Delhi, 4th edition.
5. Garrow.JS & James W.P.T, 1993.Human Nutrition and Dieteics, Church Hill Living Stone.
6. Robinson, 1990. Normal and Therapeutic Nutrition, Oxford & LBM Publishing, Calcutta, Bombay, 17th edition.
7. Davidson, Pasmore P and Break LP, 1986. Human Nutrition and Dietetics, English language book society, Livingstone.
8. Karran, S. J. and K. G. M. M. Alberti, 1980. Practical Nutritional Support, John Wiley and Sons. Inc. New. York.

OUTCOME:

This course offers the students about the significance of diet in various health conditions.

----------**********----------

36532 DIETETICS IN LIFE STYLE DISEASES	
Maximum marks: 100	**Credit: 4**

Objectives:

To enable the students

- ✓ To gain knowledge about the principles of diet therapy and different therapeutic diets
- ✓ To develop aptitude for taking up dietetics as a profession.

BLOCK-I: DIETETICS IN STRESS AND WEIGHT MANAGEMENT

UNIT I

Stress – definition, types, psychosomatic disorders due to stress and functional adjustment.

UNIT II

Biological effects of stress on various systems-brain, cardiovascular system, respiratory system, non-vital organs and immune system.

UNIT III

Stress enhancing food, antistress foods and nutrients. Dietary guidelines for the management of stress.

UNIT IV

Nutrition for weight management -components of body weight, adipose tissue and regulation of body weight. Obesity-assessment, types, causes and complications.

BLOCK-II: DIETETICS IN WEIGHT REDUCTION AND DIABETES

UNIT V

Weight reduction techniques-dietary management, surgical management, lifestyle modification, Underweight-causes, complications and dietary management.

UNIT VI

Diabetes mellitus - Classification, symptoms, diagnosis, causes and complications. Management of diabetes-dietary management, artificial sweetners, diet and insulin and lifestyle management.

UNIT VII

Diabetes Insipidus & Gestational diabetes – causes, complications, dietary and life style management.

BLOCK-III: DIETETICS IN CARDIOVASCULAR DISEASES

UNIT VIII

Cardiovascular diseases - Risk factors, Blood lipids-Classification, assessment, dyslipidemia and hypercholesterolemia, Nutritional Risk Factors.

UNIT IX

Atherosclerosis - disease progression, causes, symptoms and clinical findings. Management-dietary and lifestyle.

UNIT X

Dietary management in angina pectoris, myocardial infarction and cardiac failure. Hypertension classification, causes, complications and dietary management.

BLOCK-IV: DIETETICS IN CANCER, DISEASES OF NERVOUS SYSTEM AND MUSCULO SKELETAL SYSTEM

UNIT XI

Cancer - Classification, development of cancer, risk factors-environmental, hereditary & nutritional.

UNIT XII

Nutritional effects of cancer – cachexia, energy metabolism, substrate metabolism and abnormalities in metabolism.

UNIT XIII

Cancer therapy-chemotherapy, radiation therapy, surgery, Immuno therapy and bone marrow transplantation. Nutritional problems of cancer therapy-dietary management. Role of food in the prevention of cancer.

UNIT XIV

Nutritional management in diseases of nervous system, and musculo skeletal system -Dysphagia, Epilepsy, Hyperkinetic Behaviour Syndrome, Etiology, dietary treatment in above conditions.

REFERENCES

1. Judith L. Buttriss, Ailsa A. Welch, John M. Kearney, Susan A. Lanham. 2017. -New. Public Health Nutrition, 2nd Edition, ISBN: 978-1-118-66097-3.
2. Louise Goff, Pamela Dyson. 2015. Advanced Nutrition and Dietetics in Diabetes. Wiley Blackwell.
3. Srilakshmi, B. 2006. Dietetics, New Age International (P) Ltd, Chennai.
4. Mohan, L.K. and Shump, S.E. 2001.Krause's Food Nutrition & Diet therapy, W.B.Sauders
5. Company, XII edition.
6. Shills,E.M., Olson,S.J. and Shiks,M.C. 1994. Modern Nutrition in health and disease, Lea and Febringer, Philadelphia, 8th edition.

OUTCOME:

At the end of this course, the students can interpret the role of dietetics and diet therapy.

----------**********----------

36533 - COMMUNITY NUTRITION	
Maximum marks: 100	**Credit: 4**

Objectives:

To enable the students

- ✓ To gain insight in to the national nutritional problems and their implications
- ✓ To understand the international contribution towards nutritional improvements in India.
- ✓ To develop skills in organizing and evaluating nutrition projects in the community.

BLOCK-I: ASSESSMENT OF NUTRITIONAL STATUS AND MALNUTRITION

UNIT I

Assessment of nutritional status - food and nutritional problems in the community, nutritional status of an individual and community.

UNIT II

Direct and indirect methods of nutritional assessment: clinical examination, nutritional anthropometry, biochemical methods, dietary survey.

UNIT III

Protein–energy malnutrition (PEM) - Aetiology, prevalence, symptoms and preventive measures.

UNIT IV

Ecology of malnutrition, nutrition and infection, Nutritional disorders: anaemia, vitamin A deficiency, iodine deficiency disorder.

BLOCK-II: MALNUTRITION IN INDIA AND NUTRITION INTERVENTION PROGRAMMES

UNIT V

Prevalence of malnutrition in India: Common nutritional problems-prevalence, morbidity and mortality rate.

UNIT VI

Strategies to overcome malnutrition in India - Need for an integrated approach to solve the problems of malnutrition.

UNIT VII

Nutrition intervention programmes. Agriculture planning, role of food technology, Environmental sanitation and Health.

UNIT VIII

Objectives and operation of nutrition intervention programmes, and other programmes organized by governmental and non-governmental agencies for the vulnerable sections of the population.

BLOCK-III: ORGANIZATIONS CONCERNED WITH MALNUTRITION AND NUTRITION EDUCATION

UNIT IX

National organizations concerned with food and nutrition- ICMR, ICARM, CHEB, CSWB and SSWB.

UNIT X

International organizations concerned with food and nutrition, FAO, WHO, UNICEF, CARE, AFPRO, CWS and World Bank.

UNIT XI

Nutrition education - nature and importance to the community, training workers in nutrition education and extension work-when to teach, whom to teach and who is to teach.

BLOCK-IV: NUTRITION EDUCATION PROGRAMMES, FOOD PRODUCTION AND FOOD SPOILAGE

UNIT XII

Principles of planning, executing and evaluating nutrition education programmes, problems of nutrition education programmes.

UNIT XIII

Food production -Objectives in agriculture planning in relation to nutrition. Green Revolution, Blue Revolution, White Revolution and Yellow Revolution.

UNIT XIV

A brief review of losses of foods in the post-harvest period and agents causing food spoilage.

REFERENCES

1. Park.K, 2017. "Park's text book of preventive and social medicine", 24th edition, M/S, Banarsidas Bhanot publishers, Jabalpur.
2. Bamji, MS, 2017. "Textbook of human Nutrition", Oxford and IBH Publishing Co, New Delhi.
3. A. K. Nigam, 2015. Statistical Aspects of Community Health and Nutrition. Woodhead Publishing India in Food Science and Nutrition.
4. Michael J. Gibney, Hester H. Vorster, Frans J. Kok, 2002. "Introduction to Human Nutrition (The Nutrition Society Textbook)" Wiley-Blackwell.
5. Jeliffee.D.B, 1996. "Assessment of Nutritional Status of the community", World Health Organisation, Geneva.
6. Swaminathan.M, 1986. "Principles of Nutrition and Dietetics", Bangalore publishing company Ltd, Bangalore

OUTCOME:

At the end of this course, the students will acquire knowledge about the basic principles and practical applications of public health and nutrition.

----------**********----------

36534 - Lab. III: CLINICAL AND THERAPEUTIC NUTRITION, DIETETICS IN LIFE STYLE DISEASES, COMMUNITY NUTRITION	
Maximum marks: 100	**Credit: 4**

Objectives:

To enable the students

- ✓ To obtain knowledge on different therapeutic diets and their preparation

CLINICAL AND THERAPEUTIC NUTRITION

1. Preparation of hospital diets - routine hospital diets, regular diet, soft diet, full fluid diet and tube feeding blends.
2. Diet in febrile conditions - Acute & chronic fevers – typhoid, tuberculosis.
3. Diet in - Peptic ulcer, gastritis, diarrhea
4. Diet in constipation, malabsorption syndrome.
5. Diet in Cirrhosis, hepatitis, cholelithiasis and pancreatitis.
6. Diet in hypothyroidism, hyperthyroidism, gout, phenyl ketonuria, Lactose intolerance.
7. Diet in Atherosclerosis, hypercholesterolemia, hypertension, myocardial infarction.
8. Diet in cancer.

DIETETICS IN LIFE STYLE DISEASES,

1. Diet in Diabetes mellitus and Gestational Diabetes.
2. Diet in obesity and underweight
3. Diet in Glomerulonephritis, nephrosis, nephrolithiasis & dialysis.

COMMUNITY NUTRITION

1. Diet in Anaemia, protein calorie malnutrition,
2. Diet in vitamin A, D, E, K, C and B deficiency.

REFERENCES

1. Ellen Davis, 2017. Fight Cancer with a Ketogenic Diet: Using a Low-Carb, Fat-Burning Diet as Metabolic Therapy, 3rd edition, Ellen Davis.
2. Sylvia Escott-Stump, 2015. Nutrition and Diagnosis-Related Care, Lippincott Williams and Wilkins; 8th Edition.
3. A. Catharine Ross, Benjamin Caballero, Thomas R. Ziegler M.D, 2012. Modern Nutrition in Health and Disease (Modern Nutrition in Health & Disease (Shils)) 11th Edition.
4. Mohan, L.K. and Shump, S.E, 2001. Krause's Food Nutrition & Diet therapy, W.B. Sauders Company, 12th edition.
5. Antia FP, Clinical Dietetics and Nutrition, 1997. Oxford University Press, New Delhi, 4th edition.
6. Shills, E.M., Olson, S.J. and Shiks, M.C, 1994. Modern Nutrition in health and disease, Lea and Febringer,Philadelphia,8th edition.
7. Garrow.JS & James W.P.T, 1993. Human Nutrition and Dieteics, Church Hill Living Stone.
8. Karran, S. J. and K. G. M. M. Alberti, 1980. Practical Nutritional Support, John Wiley and Sons. Inc. New York.

----------**********----------

36541- PAEDIATRIC NUTRITION	
Maximum marks: 100	**Credit: 4**

Objectives:

To enable the students

- ✓ To realize the importance of nutritional care and nourishment of children.
- ✓ To understand the nutritional requirements of children and the effects of paediatric diseases

BLOCK-I: NUTRITION IN INFANCY AND IMMUNIZATION SCHEDULES

UNIT I

Infancy - Physiological development, assessment of nutritional status.

UNIT II

Anthropometric measurements, biochemical parameters, clinical & dietary data of infants.

UNIT III

Nutritional and food requirements for infants.

UNIT IV

Immunization schedule during pregnancy, infancy and childhood.

BLOCK-II: NUTRITIONAL MANAGEMENT OF INFANTS AND NEWBORN SICKNESS

UNIT V

Nutritional management of premature baby, low birth weight babies and children with developmental disabilities.

UNIT VI

Infant lactation- Characteristics, causes and complications, feeding methods, growth and nutritional assessment of infant's lactation.

UNIT VII

Identification of newborn sickness-Detection of abnormal signs- cyanosis, jaundice, respiratory distress.

UNIT VIII

Bleeding, seizures, refusal and feed, abdominal distention, failure to pass meconium and urine of sick newborn.

BLOCK-III: CLINICAL NUTRITION IN INFANTS

UNIT IX

Nutritional management in malnutrition -Protein–energy malnutrition (PEM), anaemia, scurvy, rickets, vitamin A deficiency, obesity of Childhood.

UNIT X

Underweight and underweight nutrition- short term and long term consequences in infants.

UNIT XI

Nutritional management of Diarrhoea, typhoid, TB and hepatitis of infants.

BLOCK-IV: NUTRITIONAL MANAGEMENT FOR CHILDREN WITH SPECIAL CONDITIONS

UNIT XII

Lactose intolerance, celiac disease, inflammatory bowel disease, constipation and fat absorption test diet of infants. (Calculation of fluids & electrolytes-both deficit and maintenance and management of calorie intake).

UNIT XIII

Nutritional management for children with special conditions - Autism and ADH (Attention Deficit Hyperactivity disorder), epilepsy and AIDS.

UNIT XIV

Measuring, recording and plotting growth of infants.

REFERENCES

1. Pooja Gupta, 2017. Food, Nutrition And Health, S Chand Publishing, India
2. Sibal Anupam, 2015. Textbook of Pediatric Gastroenterology, Hepatology And Nutrition, Jaypee Brothers Medical Publishers; first edition.
3. A. Catharine Ross, Benjamin Caballero, Thomas R. Ziegler M.D. 2012. Modern Nutrition in Health and Disease (Modern Nutrition in Health & Disease (Shils)) Eleventh Edition.
4. Nutrition in pediatrics: Basic Sciences & clinical Applicatios, W. Allan Walker, John B Watkins & Christopher Duggan, 2003. BC Decker Inc, Hamilton, Ontario.
5. Mahan, L.K. and Escott-Stump, S. 2000. Krause's Food Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Ltd.
6. Shils, M.E., Olson, J.A., Shike, M. and Ross, A.C. 1999. Modern Nutrition in Health and Disease, 9th Edition, Williams and Wilkins.
7. Fauci, S.A. et al. 1998. Harrison's Principles of Internal Medicine, 14th Edition, McGraw Hill.
8. Escott-Stump, S. 1998. Nutrition and Diagnosis Related Care, 4th Edition, Williams and Wilkins.
9. Walker, W.A. and Watkins, J.B. 1985. Nutrition in Pediatrics, Boston, Little, Brown & Co.

OUTCOME:

At the end of this course, the students will be able to know about the diet and nutrition of infants and children.

----------**********----------

36542 - FOOD MICROBIOLOGY AND SANITATION	
Maximum marks: 100	**Credit: 4**

Objectives:

To enable the students

- ✓ To understand the common micro-organisms associated with food borne illness
- ✓ To study about the microorganisms present in different food products.
- ✓ To study about the food packaging and labeling methods.

BLOCK-I: FUNDAMENTALS OF MICROBIOLOGY (YEAST, MOULDS AND VIRUSES)

UNIT I

Fundamentals of Microbiology – Introduction, development of microbiology. Bacteria- morphology and cultural characteristics and its importance.

UNIT II

Yeast- Morphology, culture, physiology, classification and industrial importance of yeast .

UNIT III

Moulds-morphology, physiology and multiplication, significance of moulds and common household moulds in relation to food science.

UNIT IV

Viruses and bacteriophages - discovery, morphology, reproduction and its importance.

BLOCK-II: CONTAMINATION, SPOILAGE, PRESERVATION AND MICROBES OF FRUITS, VEGETABLES AND CEREALS

UNIT V

Contamination of foods from external sources, General principles underlying spoilage - chemical changes by microorganisms.

UNIT VI

General principles of food preservation- Asepsis, Removal, Anaerobic conditions, High temperature, Low temperature, Drying, Food additives and Radiation

UNIT VII

Microbiology of fruits and vegetables - contamination, spoilage, preservation, and control of microorganisms.

UNIT VIII

Microbiology of cereals and cereal products - contamination, spoilage, preservation, and control of microorganisms.

BLOCK-III: MICROBES IN FLESHY FOODS, CANNED FOODS AND FOOD BORNE DISEASES

UNIT IX

Microbiology of fleshy foods, poultry and fish - Contamination, Spoilage , Preservation and control

UNIT X

Spoilage of Canned foods- causes of spoilage, appearance of the unopened container, grouping of canned foods on the basis of acidity, types of biological spoilage of canned foods.

UNIT XI

Food borne diseases –Food borne illness (bacteria), Food borne poisioning, infection and intoxication (non bacterial)

BLOCK-IV: FOOD SAFETY, PACKING AND FOOD STANDARDS

UNIT XII

Food Sanitation and safety – Personal hygiene-care of hands, sanitation, equipment plant, plant constructions, personal facilities, water supplies and seawage disposal.

UNIT XIII

Food packaging – Packaging methods. Moisture sorption properties of foods and selection of packaging materials. Interactions between packaging and food toxicity hazards. Bar coding - Nutrition labeling and nutrition claims, coding of food products. Packaging laws and regulations

UNIT XIV

Food laws and standards –Bureau of Indian standards - PFA, FPO, MMPO, AGMARK, CCFS, CFL, BIS & FSSAI - Consumer protection act, 1986. International standards- Codex alimentarius, ISO, WHO, FAO, WTO and HACCP.

REFERENCES

1. William C. Frazier, Dennis C. Westhoff, N.M. Vanitha, 2017. Food Microbiology, McGraw Hill Education; Fifth edition.
2. Mahendra Raj, Pal Mahendra, 2015. Sanitation in Food Establishments. LAP Lambert Academic Publishing.
3. Srilakshmi B.2008. Food Science. 4th Edition. New Age International Private Limited, New Delhi.
4. Shakuntala M.N., Shadaksharaswamy M. 2002. Foods –Facts and Principles. New Age International Publishers, New Delhi.
5. Roday,S 1999. Hygiene and Sanitation in Food Industry. Tata Mc Graw Hill Publishing Company Ltd., New Delhi.
6. Frazier,W.C & Westhoff, D.C. Food Microbiology. Tata MC Graw, 1997. Hill Publishing Company Ltd., New Delhi, 5tth Edition.
7. Potter,N.Hotchkiss, H.J. 1996. Food Science (5^{th} edition) CBS Publishers and Distributors, New Delhi.

OUTCOME:

This course will provide the students about the role of microbes in various food products, food spoilage and food quality.

----------**********----------

36543 - FOOD BIOTECHNOLOGY & BIOSTATISTICS	
Maximum marks: 100	**Credit: 4**

Objectives:

To enable the Students

- ✓ To understand the application of Nutritional biotechnology.
- ✓ To obtain knowledge about the recent trends in food technology.
- ✓ To know the basic concepts of sampling and data analysis.
- ✓ To understand the applications of statistical methods in scientific research.

BLOCK-I: FOOD PROCESSING TECHNOLOGY

Unit I

Introduction to food biotechnology; Fermentation Technology **–** batch and continuous process, fermenter design, bioprocess control.

Unit II

Enzymes in food industry **–** Soluble enzymes, immobilized enzymes, amylase, invertase, isomerase – Synthesis, process and applications in food industries.

Unit III

Single cell protein **–** Production of microbial protein. SCP – substrates, nutritional value. Culture and process – spirulina, mushroom and yeast biomass production.

Unit IV

Regulatory aspects of biotechnology **–** Downstream processing, biosensors, biochips. Impact of biotechnology on the nutritional quality of foods.

BLOCK-II: FOOD TOXICANTS, ADDITIVES AND FERMENTED FOODS

Unit V

Natural food toxicants **–** Sources, toxicity, elimination – Lead, Mercury, Phthalates (used in plastics), Pesticides, haemagglutinins, cyanogens, saponins, gossypols, lathyrogens, favism and carcinogens.

Unit VI

Biotechnology in food industries**:** Food additives, synthesis. Acidulants – citric acid, gluconic acid, lactic acid. Sweeteners – glucose syrup and High Fructose Corn Syrup (HFCS).

Unit VII

Fermented foods – Alcoholic beverages, cheese making, fermented soya based foods, meat fermentation, vinegar, safety aspects of foods produced by biotechnology.

BLOCK-III: INTRODUCTION TO BIOSTATISTICS

Unit VIII

Introduction to biostatistics **–** Basic definitions and applications. Sampling – representative sample, sample size, sampling bias and sampling techniques.

Unit IX

Data collection and presentation **–** Types of data, methods of collection of primary and secondary data, methods of data presentation, graphical representation by histogram, polygon, ogive curves and pie diagram.

Unit X

Data classifications – categories and measurements, discrete and continuous variables. Tabulation scheme, preparation of tabular forms, methods of securing accuracy in tabulation.

Unit XI

Surveys – Graphical and diagrammatic representations. Use of computers in data processing and presentation. Choice of the sample, random samples, systematic samples, cluster samples/multistage sample and quota sample. Sources of bias and methods of reducing bias.

BLOCK-IV: APPLIED STATISTICS

Unit XII

Measures of central tendency – Mean, median, mode, their relative advantages and disadvantages, Measures of dispersion, mean deviation, coefficient of variation, percentiles and percentile ranks.

Unit XIII

Correlation – Association of attributes, contingency table, correlation, coefficient of correlation and its interpretation, rank correlation, regression equations and predictions.

Unit XIV

Probability – Rules of probability and its applications. Distribution – Normal, binomial, their properties. Importance of distributions in statistical studies. Large and small samples, X and F tests, tests for independence using contingency, analysis of variance and applications.

REFERENCES

1. B Antonisamy, Prasanna S. Premkumar, Solomon Christopher, 2017. Principles and Practice of Biostatistics, Elsevier India.
2. Ravishankar Rai V, 2015. Advances in Food Biotechnology, Wiley-Blackwell.
3. Murray, R.K. 2012. Metabolism of xenobiotic in Harphers Biochemistry, 22nd Ed, V.W. Prentice Hall Inc.
4. Dubey , R.C. 2006. "A textbook of Bio-technology", S.Chand and Company Ltd., New Delhi.
5. Kelly Anne Meckling, 2006. "Nutrient-Drug Interactions (Nutrition and Disease Prevention)" CRC Press.
6. J. Richard, Sundar P. S. S. Rao, 2006. "Introduction to Biostatistics and Research Methods".
7. Marcello Pagano, Kimberlee Gauvreau, 2000. "Principles of Biostatistics" S.Chand (G/L) & Company Ltd; 2nd edition.
8. David Moore, George P. McCabe, 1998. "Introduction to the Practice of Statistics" 3rd Edition by W. H. Freeman.
9. Parar. F.S.K. 1997. Adverse drug reactions and treatment of poisoning and drug interactions, S. Chand and Co, New Delhi.
10. Irfan A Khan, Atiya Khanum, 1994. "Fundamentals of Biostatistics" Ukaaz Publications.

OUTCOME:

This course will provides the broad overview about the food processing techniques and fundamentals of biostatistics.

----------**********----------

36544 - LAB. IV: PAEDIATRIC NUTRITION, FOOD MICROBIOLOGY AND SANITATION & FOOD BIOTECHNOLOGY & BIOSTATISTICS	
Maximum marks: 100	**Credit: 4**

Objectives:

To enable the students

- To study the importance of Paediatric nutrition
- To study the basic techniques of food microbiology and biotechnology
- To introduce the basics of various food processing and preservation technologies.
- To interpret the data using statistical tools.

PAEDIATRIC NUTRITION

1. Development of low cost recipes
    a. Infants
    b. Preschoolers
    c. Elementary school children.

FOOD MICROBIOLOGY AND SANITATION

1. Isolation of microorganisms from spoiled food sample.
2. Pure culture and preservation of bacteria.
3. Gram staining
4. Motility test
5. Hydrolysis of starch, gelatin and protein.
6. Identification of prepared slides
    a. Mould - mucor, rhizopus, aspergillus, penicillium, yeast
    b. Bacteria – bacilli.

FOOD BIOTECHNOLOGY

1. Determination of pH of different foods using pH meter.
2. Study quality characteristics of foods preserved by drying/dehydration/ freezing.
3. To perform pasteurization of fluids using different methods.
4. To perform blanching of different plant foods.
5. Methods of Food sampling and concept of shelf life of different foods

BIOSTATISTICS

1. Tabulation and graphical representation of data
2. Calculation of mean, median and mode
3. Calculation of standard deviation, standard error and ANOVA (One way and Two way)
4. Chi-Square test, t-Test, Regression and correlation.

REFERENCES

1. B Antonisamy, Prasanna S. Premkumar, Solomon Christopher, 2017. Principles and Practice of Biostatistics, Elsevier India.
2. Sibal Anupam, 2015. Textbook of Pediatric Gastroenterology, Hepatology And Nutrition, Jaypee Brothers Medical Publishers; first edition.
3. Bawa. A.S, O.P Chauhan et al. 2013. Food Science. New India Publishing agency.
4. A. Catharine Ross, Benjamin Caballero, Thomas R. Ziegler M.D. 2012. Modern Nutrition in Health and Disease (Modern Nutrition in Health & Disease (Shils)), 11th Edition.
5. Rao PG, 2010. Fundamentals of Food Engineering, PHI Learning Pvt Ltd, New Delhi.
6. Ramaswamy H and Marcott M, 2006. Food Processing Principles and Applications CRC Press.
7. Meyer, 2004. Food Chemistry, New Age.
8. Frazier WC and Westhoff DC, 2004. Food Microbiology, TMH Publication, New Delhi.
9. B. Srilakshmi, 2002. Food science, New Age Publishers.
10. Toledo Romeo T, 1999. Fundamentals of Food Process Engineering, Aspen Publishers.
11. Desrosier NW and Desrosier JN, 1998. The Technology of Food Preservation, CBS Publication, New Delhi.
12. Potter NH, 1998. Food Science, CBS Publication, New Delhi.
13. Paine FA and Paine HY, 1992. Handbook of Food Packaging, Thomson Press India Pvt Ltd, New Delhi.

----------**********----------

DURATION OF THE PROGRAMME – TWO YEARS

The candidate who joins M.Sc., Home Science – Nutrition and Dietetics has to finish the course within a period of two years with four semester pattern.

FACULTY AND SUPPORT STAFF REQUIREMENT

Staff Category	Required
Core Faculty	3
Faculty -Specialization	2
Laboratory Assistant	1
Clerical Assistant	1

INSTRUCTIONAL DELIVERY MECHANISM

- Engaging learners actively in their learning
- Creating and maintaining an effective, safe learning environment
- Providing learners with information on what to expect
- Basing content on immediately applicable information and skills.
- Internet based learning and Computer-Assisted Instruction (CAI)
- Group discussion
- Webinar based intellectual support
- The Self Learning Material (SLM) will be given to the students in print form as well as in CDs (Soft copy).
- The examinations, evaluations and certificate issuing will be done by controller of examinations, Alagappa University.

CREDIT HOURS

Each semester there will be one contact programme of 168 hours duration in total comprising of both theory and practical (120 hours practical and 48 hours theory) for the Two years **M.Sc., HOME SCIENCE - NUTRITION AND DIETETICS.**

(f) PROCEDURE FOR ADMISSIONS, CURRICULUM TRANSACTION AND EVALUATION

Admission for M.Sc., HOME SCIENCE - NUTRITION AND DIETETICS shall be based on purely on merit basis. A candidate who has passed Bachelor's Degree in Science (Home Science, Botany, Zoology, Biochemistry, Chemistry, Biotechnology, Microbiology, Food Science and Quality Control and Clinical Nutrition and Dietetics, M.B.B.S./ B.H.M.S./ B.A.M.S./ B. Pharmacy and any other relevant subjects) degree with at least 55% of marks eligible for applying this programme.

The curriculum transaction will be done using advanced teaching aids and equipments. The students will be evaluated by examinations. There shall be no passing minimum for internal. For external examination, passing minimum will be 50%. In aggregate (External + Internal) the passing minimum shall be 50% for each theory and practical paper. Grading shall be based on overall marks obtained.

FEES STRUCTURE

Sl. No.	Fees Detail	Amount in Rs.		Nature of Fees
		First Year	Second Year	
1	Admission Processing Fee	**300**	**-**	Non- Refundable
2	Course Fee	**20,000**	**20,000**	Non- Refundable
3	ICT Fee	**150**	**150**	Non- Refundable
	TOTAL FEES	**20450**	**20150**	Non- Refundable

EVALUATION

The examinations shall be conducted separately for theory and practical's to assess the knowledge acquired during the study. There shall be two systems of examinations viz., internal and external examinations. In the case of theory courses, the internal evaluation shall be conducted as Continuous Internal Assessment via. Student assignments preparation and seminar, etc. The internal assessment shall comprise of maximum 25 marks for each course. The end semester examination shall be of three hours duration to each course at the end of each semester. In the case of Practical courses, the internal will be done through continuous assessment of skill in demonstrating the experiments and record or report preparation. The external evaluation consists of an end semester practical examinations which comprise of 75 marks for each course.

PRACTICAL'S (INTERNAL ASSESSMENT)

CIA tests	10 marks
Attendance	5 marks
Observation note book	10 marks
Total	**25 marks**

Passing Minimum

- For internal Examination, the passing minimum shall be 40% (Forty Percentage) of the maximum marks (25) prescribed for UG and PG Courses.
- For External Examination, the passing minimum shall be 40% (Forty Percentage) of the maximum marks (75) prescribed for UG and PG Courses.
- In the aggregate (External + Internal), the passing minimum shall be 40% for UG and 50% for PG courses.

EXTERNAL EXAMINATIONS

The external theory and practical examinations shall be conducted for three hours duration at the end of each semester. The external examinations shall comprise of maximum of 75 marks for each

subject. The candidate failing in any subject will be permitted to appear for each failed subject in the subsequent examination. Practical examinations and demonstration of experiments shall be conducted at the end each semester.

SCHEME OF EXTERNAL EXAMINATION

The duration of examinations for theory and practical's shall be three hours.

Question paper pattern (Theory)

- The question paper carries a maximum of 75 marks.
- The question paper consists of three sections namely Part-A, Part-B and Part-C.
- Part-A consists of 10 questions of 2 marks each (10 x 2 = 20 marks) with no choice. The candidate should answer all questions.
- Part-B consists of 5 either or choice questions. Each question carries 5 marks
- (5 x 5=25 marks).
- Part-C consists of 5 questions. Each question carries 10 marks. The candidate should answer any three questions (10 x 3 = 30 marks).

Model Question Paper (Theory)

M.Sc., DEGREE EXAMINATION

HOME SCIENCE – NUTRITION AND DIETETICS

First Semester

36511 – Human Physiology

Time : 3 hrs Maximum: 75 Marks

Part – A (10 × 2 = 20 Marks)

Answer **all** the questions

1. Power house of the cell
2. Tendons
3. Peroxisomes
4. Angioplasty
5. Orthopnoea
6. Erythroblastosis foetalis
7. Artificial kidney
8. Menarche
9. Hypothyroidsm
10. MRI

Part – B (5 × 5 = 25 Marks)

Answer **all** the questions choosing either (a) or (b)

11. (a) Write an essay about the structural organization and functions of endoplasmic reticulum and mitochondria.

Or

(b) Write an essay about Musculo skeletal system.

12. (a) Differentiate prokaryotic and eukaryotic cells.

Or

(b) Write a detailed note on fluid mosaic model of the plasma membrane.

13. (a) Discuss in detail about the functions of blood and blood proteins.

Or

(b) Write an essay about the mechanism of respiration.

14. (a) Explain in detail about the structure and functions of male reproductive organs.

Or

(b) Write an essay about the sense organs.

15. (a) Explain the principle and advantages of common test used in neurological disorders.

Or

(b) Write an essay about hormonal imbalance syndromes.

Part – C (3 × 10 = 30 Marks)

Answer **any three** questions

16. Write an essay about the classifications, structure and functions of Tissues.
17. Describe the mechanism of blood coagulation and blood coagulation disorders.
18. Write an essay about human circulatory system.
19. Explain in detail about the structure and functions of female reproductive system.
20. Write an essay about human nervous system.

Question paper pattern (Practical) (Maximum 75 marks)

Major practical	15 marks
Minor practical	10 marks
Experimental set up	5 marks
Spotters	25 marks
Viva voce	10 marks
Practical record note	10 marks
Total	75 marks

Maximum duration for completion of the course

The maximum duration for completion of M.Sc., HOME SCIENCE - NUTRITION AND DIETETICS shall not exceed five years.

MARKS AND GRADES:

The following table gives the marks, grade points, letter, grades and classification to indicate the performance of the candidate.

Range of Marks	Grade Points	Letter Grade	Description
90-100	9.0-10.0	O	Outstanding
80-89	8.0-8.9	D+	Excellent
75-79	7.5-7.9	D	Distinction
70-74	7.0-7.4	A+	Very Good
60-69	6.0-6.9	A	Good
50-59	5.0-5.9	B	Average
00-49	0.0	U	Re-appear
ABSENT	0.0	AAA	ABSENT

C_i = Credits earned for the course i in any semester

G_i = Grade Point obtained for course i in any semester.

n refers to the semester in which such courses were credited

For a semester;

Grade Point Average [GPA] = $\sum_i C_i G_i / \sum_i C_i$

Grade Point Average = Sum of the multiplication of grade points by the credits of the courses

Sum of the credits of the courses in a semester

For the entire programme;

Cumulative Grade Point Average [CGPA] = $\sum_n \sum_i C_{ni} G_{ni} / \sum_n \sum_i C_{ni}$

CGPA = Sum of the multiplication of grade points by the credits of the entire programme

Sum of the credits of the courses for the entire programme.

CGPA	Grade	Classification of Final Result
9.5-10.0 9.0 and above but below 9.5	O+ O	First Class- Exemplary*
8.5 and above but below 9.0 8.0 and above but below 8.5 7.5 and above but below 8.0	D++ D+ D	First Class with Distinction*
7.0 and above but below 7.5 6.5 and above but below 7.0 6.0 and above but below 6.5	A++ A+ A	First Class
5.5 and above but below 6.0 5.0 and above but below 5.5	B+ B	Second Class
0.0 and above but below 5.0	U	Re-appear

*The candidates who have passed in the first appearance and within the prescribed semester of the PG Programme are eligible.

Commencement of this Regulation:

These regulations shall take effect from the academic year 2018-2019 (June session) i.e., for students who are to be admitted to the first year of the course during the academic year 2018-2019 (June session) and thereafter.

(g) REQUIREMENT OF THE LABORATORY SUPPORT AND LIBRARY RESOURCES

Laboratory Support

The M.Sc., HOME SCIENCE - NUTRITION AND DIETETICS curriculum of Alagappa University has strived to offer both theory courses as well as laboratory and design practice in the field of Home Science - Nutrition and Dietetics. Instruments, chemicals and glasswares are needed for conducting practicals to the better understanding of the curricula.

Library Resources

Alagappa University students and staffs have access to a world class collection of text books, reference books, conference proceedings, back volumes, non-book materials such as CD-ROMs, high quality and trusted online resources. Students need nearly 150 books and 50 practical manuals for getting fundamental knowledge in Nutrition and Dietetics.

(h) COST ESTIMATE OF THE PROGRAMME AND THE PROVISIONS:

The cost estimate of the programme and provisions for the fund to meet out the expenditure to be incurred in connection with **M. Sc., Home Science - Nutrition and Dietetics** as follows

S.No.	Expenditure Heads	Approx. Amount in Rs.
1	Programme Development	20,00,000/-
2	Programme Delivery	24,00,000/-
3	Programme Maintenance	5,00,000/-

QUALITY ASSUARANCE MECHANISM AND EXPECTED PROGRAMME OUTCOMES

Quality assurance

- Student's feedback about staffs, teaching methods and methodologies.
- Teachers review about students.
- Continuous assessment (Model practical).
- The students give feedback on teaching every semester. Feedback is also taken on their campus experience through suggestion boxes.

Expected outcome

The learners will be professionals in preparation and service of food, develop modified diets, participate in research, and educate individuals and groups on good nutritional habits. Recently, a growing number of needs for nutritional specialists in food industry, journalism, sports nutrition, corporate wellness programs, and other non-traditional dietetics settings. The outcome of the programme is in the form of job offerings in community and public-health settings, and/or in academia and research. They can be hired by sports hostels and athlete camps, health and recreational clubs and canteens. This apart, there are opportunities in catering department of star hotels and restaurants and research laboratories of food manufacturers. They can also work from home as consultants.

Minutes of the Meeting of the Board of Studies in M.Sc., Home Science - Nutrition and Dietetics (For M.Sc., Home Science - Nutrition and Dietetics Programme to be offered through ODL Mode) held at The Directorate of Distance Education, Alagappa University, Karaikudi – 630 003, on 05.09.2017, (02.00 P.M).

Members Present

1.	Dr. E. Kannapiran	-	Chairman
2.	Dr. P. Rameshthangam	-	Member
3.	Dr. K. Pandima Devi	-	Member
4.	Dr. G. Selvakumar	-	Member
5.	Dr. P. Thiruchenthilnathan	-	Member

After the deliberation and discussion the board resolved the following:

1. The board considered the curriculum design and detailed syllabi of **M.Sc., Home Science - Nutrition and Dietetics** programme, prepared as per the norms by the Chairman and the Board Members, scrutinized and suitably modified the same.
2. The board resolved to approve curriculum design, detailed syllabi and other regulations for the M.Sc., Home Science - Nutrition and Dietetics programme to be offered by the Directorate of Distance Education of Alagappa University are given in Annexure I.

Dr. E. Kannapiran

Dr. P. Rameshthangam

Dr. K. Pandima Devi

Dr. G. Selvakumar

Dr. P. Thiruchenthilnathan