**THIRUVALLUVAR UNIVERSITY**

**BACHELOR OF SCIENCE**

**M.Sc. FOODS AND NUTRITION**

**DEGREE COURSE**

**CBCS PATTERN**

*(With effect from 2017-2018)*

The Course of Study and the Scheme of Examinations

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OBJECTIVES
To enable the Students to:
    To understand the general structure and functions of various systems and organs in the body.
    To understand the abnormal changes in tissues and organs in deceased condition.

UNIT-I
Cellular basis of Physiology - Body fluid compartment, membrane potential, Inter cellular communication - Homeostasis.

    Biochemical aspects of muscle tissue - structure, chemical composition, mechanism and energetics of muscle contraction, muscle fatigue.

    Biochemical aspects of nerve tissue - structure, composition & functions of nerve tissue.

UNIT-II
Endocrinology and Reproduction

    Anatomy of endocrine glands and Reproductive organs. Hormones - Mode of action, functions of hormones of the endocrine glands - Pituitary, Adrenal, Thyroid, Gonadal hormones, Pancreas, Pineal body and Parathyroid, Hypo and Hyperfunctions of the glands.

UNIT-III
Respiration and Gastro - Intestinal

Hunger, Appetite, Satiety - physiological and psychological factors affecting food intake, circadian rhythm in GI tract secretions.

UNIT-IV
Circulation and Excretion

Blood - composition, functions of formed elements of blood and plasma proteins, origin and conduction of heart beat, ECG-interpretation, Latest development in cardiac condition, cardio vascular mechanism and homeostasis.

Excretion - formation of urine, characteristics of urine, normal and abnormal constituents of urine, acid - base balance.

UNIT-V
Nervous system – Structure and functions of brain (briefly) and spinal cord; structure and functions of neuron; conduction of neuro impulse, role of neuro transmitters; blood brain barriers, CSF, hypothalamus and its role in various body functions.

Immunity - Properties, natural and acquired Immunity, features of immune responses, antigen - antibodies - types, properties, antigen - antibody interaction, Auto immune disorder and allergy.

REFERENCES:


OBJECTIVES
To enable the Students to

- Understand the principles of cooking
- Learn the composition of various foods.
- Study the effects of cooking on composition

UNIT-I
Food Groups

- Cereals - Rice & wheat and other Millets - Composition and Nutritive Value.
- Starch - Sources, Characteristics, Principles of Starch cookery.
- Batter and Dough - Structure, Principle, Properties, Different types of flour, Gluten properties, Gluten formation, Dextrinisation, Gelatinisation and Retrogradation.
- Flour - Types, properties. Bread - yeast leavened, Quick bread, pastries. - Role of ingredients & preparation.

UNIT-II
Pulses - Composition, types, Cooking methods, factors affecting cooking quality, nutritive value, toxic constituents and its removal, Germination and factors affecting Germination.

- Vegetables - Structure, Classification, Composition, Nutritive value, Methods of Cooking, Changes on Cooking - pigments.
- Fruits - Structure, Classification, Composition, Ripening of fruits, changes on ripening, Pectic substances, Cooking changes.

UNIT-III
Egg - Structure, Composition, Nutritive value, Grading, Methods of Cooking and Role of egg in cookery.

- Meat - Structure, Composition, Nutritive value, Classes and Grades of meat cuts, Changes on cooking and Rigor mortis. Poultry - Composition, Nutritive value, Grades, Methods of cooking, Effects of cooking.
- Fish - Composition, Nutritive value, Types, Cuts, Selection, Spoilage, Cooking and Factors effecting cooking quality.

UNIT-IV
Fats & Oils - Types properties of fat relating to cooking, Rancidity, Tests for rancidity, Hydrogenation, Changes in fat during heating, Factors affecting fat absorption, Shortening, Use of fat in tenderness of cooked products.

UNIT-V
Sugar cookery - Types of sugar, Properties, Crystallization, Stages in Sugar cookery, Application in Indian recipes.
Beverages - Classification, Nutritive value, Preparation of milk based beverages.
Spices and Condiments - Use of spices and condiments in Indian cookery.

REFERENCES

PAPER – 3

ESSENTIALS OF MACRO NUTRIENTS

OBJECTIVES
To enable the students to
   Understand the role of macronutrients.
   The metabolism of macronutrients.

UNIT-I: CARBOHYDRATES
   Classification, sources, functions, digestion, absorption, utilization and storage, hormonal regulation of blood glucose, role of carbohydrate in dental caries.
   Dietary fibre - Development and concept, role of fibre in lipid metabolism, colon function, blood glucose level and GI tract functions - Disadvantages of Dietary fibre.

UNIT-II: LIPIDS
   Classification, sources, functions, digestion, absorption, utilization and storage, effects of deficiency and excess of fat, lipotropic factors, role of saturated fat, cholesterol, lipoprotein and triglycerides and EFA in the diet.

UNIT-III: PROTEINS AND AMINOACIDS
   Classification, sources, functions, digestion, absorption, utilization and storage, protein quality evaluation, nutritional classification of aminoacids, aminoacid balance, imbalance and toxicity, aminoacid pool.

UNIT-IV: ENERGY
   Energy value of foods, SDA, energy production, factors affecting thermogenesis, energy utilization by cells, energy output - BMR, physical activity, factors affecting energy input - hunger, appetite, energy balance, measurement of energy content of food.

UNIT-V
   Inter relationship between carbohydrate, fat and protein, nutritional adaptation and hypotheses.

REFERENCES:

Journals:

1. Nutrition Reviews
2. Journal of Nutrition
3. American Journal of Clinical Nutrition
4. British Journal of Nutrition
5. European Journal of Clinical Nutrition
6. International Journal of Vitamin and Nutrition Research
7. International Journal of Food Science and Nutrition
8. Nutrition Research
9. Ann Nutr Metab
ELECTIVE

PAPER – 1

HEALTH AND FITNESS

UNIT-I
Definition of Health and wellness - Factors affecting health and wellness. Physiological, psychological and social health.

UNIT-II
Fitness - Definition, basic components of physically active life style in preventing obesity, osteoporosis, heart disease, and diabetes, Physical fitness tests - for flexibility, muscle endurance (any 3 tests for each) and cardiovascular endurance.

UNIT-III
Nutrition and exercise - energy requirement for, aerobic and anaerobic exercises, carbohydrate loading, water and dehydration, special foods. Importance of exercise in preventing life style diseases - Diabetes, CVD, hypertension, obesity and osteoporosis.

UNIT-IV
Nutrition in sports – Sports specific requirements diet manipulation pre game and post game means, Use of different nutragenic aids and commercial supplements. Sports drinks, Diets for persons with high energy requirements stress, fracture and injury.

UNIT-V
Awareness about the alternative systems for health and fitness- Ayurveda, yoga’ meditation, vegetarianism and traditional diets. Special nutritional needs for monitoring, space, military and sea voyage.

REFERENCES
SEMESTER II
PAPER – 4
ESSENTIALS OF MICRO NUTRIENTS

OBJECTIVES:

To enable students to:
- Gain a deeper understanding of principles of nutrition.
- Develop competence to carry out investigations in nutrition.

UNIT-I : HOMEOSTASIS MAINTENANCE
Homeostasis-Definition, Concepts and mechanism.
Electrolytes - Electrolyte content of fluid compartments, Functions of electrolyte, Sodium, Potassium and Chloride, Absorption, Transport and Electrolyte Imbalance, Factors affecting electrolyte balance, Maintaining electrolytes, hydrogen ion balance, Water balance.

UNIT-II : FAT SOLUBLE VITAMINS
Vitamins A, D, E, K - Functions, Physiological action, Digestion, Absorption, Utilization, Transport, Storage, Excretion, Source, RDA, Deficiency, Diagnosis of deficiency, Toxicity, Interaction of fat soluble vitamins with other nutrients. Hypo and hyper vitaminosis.

UNIT-III : WATER SOLUBLE VITAMINS
Thiamine, Riboflavin, B₁₂, Folic acid, Pyridoxine, Pantothenic acid, Niacin, Biotin, Ascorbic acid - Functions, Physiological action, Digestion, Absorption, Utilization, Transport, Storage, Excretion, Source, RDA, Deficiency, Diagnosis of deficiency, Toxicity, Interaction of fat soluble vitamins with other nutrients.

UNIT-IV : MACROMINERALS
Calcium - Distribution in the body digestion, Absorption, Utilization, Transport, Excretion, Balance, Deficiency, Toxicity, Sources, RDA, Regulation of calcium concentration, Calcium interaction with other nutrients.
Phosphorus - Distribution, Concentration in the body, Digestion, Absorption, Utilization, Transport, Storage, Excretion, Sources, Calcium: Phosphorus ratio.
Iron - Distribution, Concentration in the body, Digestion, Absorption, Utilization, Transport, Storage, Excretion, Sources, RDA, interaction with other nutrients, Role of iron in prevention of anaemia.
UNIT-V : MICRO MINERALS
Iodine, Fluoride, Mg, Cu, Zn, Se, Manganese, Chromium, Distribution in the human body, Physiology, Function, deficiency, Toxicity and Sources.

REFERENCES:


4. Mahan, Kathleen L. Krause’s Food, Nutrition and Diet Therapy, W.B.Saunder’s, 11th Edition 2010


6. Recommended dietary intakes for Indian – Indian Council of Medical Research, New Delhi, 2012.

Journals:


4. Indian Journal of Medical Research, Indian Council of Medical Research, New Delhi.
OBJECTIVES:

To know the computation of allowances.
To impart knowledge on the importance of nutrition during life span.
To enlighten on the dietary modifications.

UNIT-I
Recommended allowances - RDA for Indians, basis for requirement, computation of allowance based on energy expenditure, components of energy expenditure. General concepts about growth and development through different stages of life.

UNIT-II
Nutrition in Pregnancy
Stages of gestation, maternal weight gain, complications of pregnancy, maternal physiological adjustments, nutritional problems and dietary management, importance of nutrition during and prior to pregnancy, teenage pregnancy - nutritional problems and dietary management, planning a menu.

UNIT-III
Nutrition during Lactation
Physiology of lactation, hormonal control and reflex action, efficiency of milk production, problems of breast feeding, nutritional composition of breast milk, nutritional concerns during lactation, special foods during lactation, dietary modification, planning a menu.

Nutrition in Infancy
Infant feeding, nutritional needs, premature infant and their feeding, weaning foods.

Feeding problems, infant formulae lactose intolerance, planning menu.

Nutrition in Pre-school - Physiological development related to nutrition, feeding problems, behavioural characteristics, nutritional requirement and planning diet.

UNIT-IV
Nutrition in school children - feeding school children and factors to be considered. Planning a menu, feeding problems, packed lunch.

Nutrition during Adolescence - changes in growth and development, hormonal influences, Age at menarche - factors affecting age at menarche, psychological problems, body image, disordered eating behaviour, nutritional problems, planning a menu.
UNIT-V  

**Nutrition in Adult and Elderly**

Nutrition and work efficiency, Premenstrual Syndrome, Menopausal and Post-Menopausal women, hormonal changes, nutritional requirement, planning a menu.

Physiological changes in aging - Psycho-social and economic factors affecting eating behaviour, social situation, knowledge and belief, institutionalization, common health problems, nutritional requirement, modification in diet, feeding old people.

**REFERENCES:**

OBJECTIVES:
To enable the students to:
   Learn about the morphology of different microorganisms.
   Study the food spoilage caused by microorganism
   Understand the various types of poisoning and infection caused by microorganism.

UNIT-I
   Types and Classification of microorganism, and important micro-organisms in foods,
morphology of yeast, mould, bacteria, virus, algae and protozoa.

UNIT-II
   Micro-organisms and food: Their primary sources in foods, cultural characteristics
   and biochemical activities. Airborne bacteria, fungi Microorganisms found in soil Normal
   flora of skin, nose, throat, GI tract

UNIT-III
   Food in relation to disease - food born diseases, food infection, intoxication,
   microbial toxins - types, bacterial poisoning and infection - causative agents and sources ,
symptoms and prevention of Staphylococcal food poisoning, botulism, salmonella, bacillus
   infection, E.coli, food poisoning of fungal origin - ergotism, aflatoxin.

UNIT-IV
   Control of microorganism - Principles of preservation, General principles underlying
   spoilage of foods. Preservation by high and low temperature, chemical preservatives, salt,
sugar as preservative, new trends in preservation.

UNIT-V
   Sterilization by Physical agents - Heat, moist heat, fractional sterilization,
pasteurization, other types of sterilization, chemical sterilization. Microbiology of water,
typical organisms in water, types of bacterial examination for water, water treatment.

REFERENCES:
CORE PRACTICAL I
ADVANCED FOOD SCIENCE

1. Cereal cookery - Preparation of rice based products - Idli, Dosai, Appam to study the effect of fermentation and soaking.

2. Preparation of wheat based products - Chappathi, phulkas, poories - with different proportion of wheat flour - study the development of gluten.

3. Pulse cookery - Effects of soaking, acid, alkali and sprouting and different methods of cooking on cooking time and quality of pulses.

4. Vegetable cookery - Effect of acid, alkali and methods of cooking on pigments.

5. Egg, meat, fish, poultry - Methods of cooking on acceptability of the various fleshy foods, foam formation and factors affecting foam formation. Special effect on colour and tenderness.

6. Fats and oils - Smoking point of different fats and oils - Determination of best frying temperature for different oils, factors affecting fat absorption.

7. Sugar cookery - Stages of sugar cookery, use of sugar in Indian recipes. Crystallization and factors affecting crystallization.

ESSENTIALS OF MACRO NUTRIENTS
(Processed and unprocessed sample)

1. Qualitative analysis - Reaction of pentoses, hexoses, Dextrin, starch, glycogen.

2. Quantitative analysis

3. Estimation of fat by Soxhlet method

4. Estimation of Total protein by Microkjeldhal method

5. Extraction of lipids from egg yolk
CORE PRACTICAL – II

ESSENTIALS OF MICRO NUTRIENTS
1. Ashing of food and preparation of ash solution.
2. Estimation of calcium in food.
3. Estimation of phosphorus in food.
4. Estimation of iron in food.
5. Estimation of ascorbic acid in cabbage by dye method.
6. Estimation of thiamine in food by fluorimetry.

NUTRITION THROUGH LIFE CYCLE
1. Menu planning, Preparation and Presentation for the following
2. Pregnancy
3. Lactation
4. Infants
5. Pre-schoolers
6. School going children
7. Adolescence
8. Adult of different working category
9. Old people
10. Menu of different variation - age specific, income specific and condition specific.
11. Menu of different variation under each:
12. Age category mentioned above
13. Weight (underweight, obesity).
15. Based on type of work.
16. Menu planning for sports persons
17. Menu planning for Mountaineering, sea voyage and space travel.
ELECTIVE
PAPER – 2
FOOD STANDARDS AND QUALITY CONTROL

OBJECTIVES:
To enable the students to:
   - Be aware of fundamental food quality control procedures.
   - Aware of common food standards
   - Know about food laws.

UNIT-I

Principles of quality control – Objectives, principles, importances, functions of quality control Raw material process control and Product inspection.

   Food adulteration and hygiene - definition, Common adulterants in different foods, method of detecting adulterated foods.

UNIT-II

   Food additives - Definitions, Types, Action.

   Leavening agents - Definitions, Classifications.

   Colour of foods - Natural colours, certified artificial colours, Non-certified colors, Use and Optimum levels. Enzymes of importance in food processing - Carbohydrates, Proteases, lipases, oxidoreductases, hydrolases.

UNIT-III

   Natural Toxins in Food: Natural toxins of importance in food- Toxins of plant and animal origin; Microbial toxins (e.g. Algal toxins, bacterial toxins and fungal toxins). Natural occurrence, toxicity and significance. Food poisoning; Mycotoxicoses of significance. Determination of toxicants in foods and their management.

UNIT-IV


   Standards for foods - Milk and milk products, Fruits and Vegetables, Beverages and Fleshy foods.
UNIT-V:

FOOD SAFETY AND HYGIENE

Meaning for food safety, Importance of food quality and safety in developing countries, Factors affecting food safety, Current food safety regulations. **HACCP-definition, principles, and affiliations(SS)**, consumer education, food safety education and training, food sampling and analysis of food

REFERENCES:


SEMESTER III
PAPER – 7
NUTRITIONAL BIOCHEMISTRY

OBJECTIVES:

To enable the students to:
- Understand the need for the study.
- Learn the various metabolic cycles.
- Analyze the significance of biochemical findings.

UNIT-I: BIOLOGICAL OXIDATION
Enzymes and co-enzymes involved in oxidation and reduction, respiratory chain, phosphates in biological oxidation and energy capture, components and role of respiratory chain and mechanism of oxidative phosphorylation, inhibitors, uncouplers and mitochondrial disease.

UNIT-II: METABOLISM OF CARBOHYDRATE
Glycolysis, Gluconeogenesis, TCA cycle, HMP shunt, glycogen metabolism, bioenergetics, disorders of carbohydrate metabolism—fructosuria, galactosemia, glycogen storage disease, pentosuria, abnormal level in blood glucose.

UNIT-III: METABOLISM OF LIPIDS
Biosynthesis and oxidation of saturated and unsaturated fatty acids, glycerides, phospholipids and cholesterol, bioenergetics, lipoproteins and their significance, metabolism and disorders of lipoprotein metabolism.

UNIT-IV: PROTEIN AND AMINOACID METABOLISM
Biosynthesis of protein, general catabolism of amino acids, glucogenic and ketogenic amino acids, deamination, transamination, urea cycle, disorders of amino acid metabolism—phenyl ketonuria, cystinuria, albinism, alkaptonuria, maple syrup disease.

UNIT-V: METABOLISM OF NUCLEIC ACIDS
Biosynthesis and degradation of purine and pyrimidine nucleotides, DNA replication and repair, biochemical importance of cyclic AMP. Disorders of purine and pyrimidine metabolism—gout, aciduria, xanthinuria, lesh-nyhann syndrome. Structure and properties of DNA, RNA—mRNA, tRNA, rRNA.

Functional tests—Gastric, liver, renal and endocrine.
REFERENCES:


PAPER – 8

RESEARCH METHODOLOGY AND APPLIED STATISTICS

OBJECTIVES:
To enable the students to:

- understand the importance of Research.
- learn about the various applications of statistics in the research.
- Familiarize on writing the project report.

UNIT-I

Meaning of research, Types of research, Objectives of research.

Collection of Data - Methods of collecting data.

Primary and Secondary data - Sources of Primary and Secondary data, Editing the data and precautions used in the use of data. Different types of research tools for collecting research data, defining and determining a problem.

UNIT-II

Sampling Design - Census and sampling survey, Different types of sampling techniques - Probability and non-probability, size of the sample, Merits & Demerits of each sampling method, Sampling errors and methods of Reducing the error.

UNIT-III

Classification and Tabulation of Data - Meaning, Objective, Types of Classification, Formation of frequency distribution, Tabulation of data - Schemes general rules, Types of tables and preparation of tabular forms.

Representation of data - Diagrammatic and Graphic significance, Types of diagrams, Types of graphs.

UNIT-IV

Measures of central tendency - Mean, Median, Mode, their relative advantages and disadvantages. Measures of dispersion - mean deviation, standard deviation, Quartile deviation, Co-efficient of variation, percentile, Association of attributes, Contingency table, correlation - coefficient of correlation and its interpretation, Rank correlation, Regression equation and predictions.

UNIT-V

Probability - Theorems, Simple Problems, Distributions - Binomial Poisson distribution, normal distribution, their properties and simple problems.
Testing of significance - Large and Small sample tests - ‘t’ test, Chi square test, and ‘F’ test - simple problems.

Writing a research report - format of thesis writing with eg.
REFERENCES:


PAPER – 9

COMMUNITY NUTRITION

OBJECTIVES:
To enable the students to:

Understand the national nutritional problems and their implications.
Understand the malnutrition problems and its prevalence in India.
Gain knowledge on the national effort in combating malnutrition.

UNIT-I
Definition and brief study of community, family, village and block.

Malnutrition - causes, ecological factors, effects of malnutrition, protein deficiency diseases - PEM, Kwashiorkor - incidence, prevalence, epidemiology. The package programmes of immunization, marasmus, nutrition education, feeding programmes, and measures to overcome malnutrition.

Vitamin deficiency - A, B1, B2, Niacin, C, D, B12, and Folic Acid - prevalence, programmes to combat.

Nutritional Anaemia - Prevalence, programmes to control.

IDD and fluorosis - Prevalence, causes, symptoms and programmes to control.

UNIT-II

UNIT-III
Nutrition and National Development, National nutritional policy - Aim, objectives, guidelines and thrust areas. PDS - Public distribution system, Agricultural planning - New strategies.

Concepts and definition of food and nutritional security at National household and individual levels.

UNIT-IV
Nutrition intervention Programmes - Objectives, operation of feeding programmes. ICDS, TINP, NNMS, IRDP, DWACRA.

National organizations - ICMR, NIN, NNMB, ICAR, CFTRI, NIPCCD.

UNIT-V

Demographic changes due to malnutrition. IMR, MMR, Mortality, morbidity rate, birth rate, sex ratio, poverty level.

Nutrition education - Merits, planning, evaluation and conduct.

Health care delivery - PHC, School Health services and their role in preventing communicable diseases.

REFERENCES


Journals:

1. Reports of the State of World’s Children, WHO and UNICEF, Oxford University.


3. Indian Journal of Medical Research, ICMR, New Delhi,

ELECTIVE
PAPER – 3
NUTRITION IN EMERGENCIES

OBJECTIVES:
1. To gain knowledge in protecting people’s right to nutrition during disaster
2. To prepare for emergencies, to prevent hunger, malnutrition and deficiency disorders
3. To create an awareness on nutrition policies and programmes to combat nutritional problems

UNIT-I
Natural / manmade disasters resulting in emergency situations.
Famine, drought, flood, earthquake, cyclone, war, civil and political emergencies.
Factors giving rise to emergency situation in these disasters.
Illustration using case studies from Indian Subcontinent.

UNIT-II
Nutritional problems in emergencies in vulnerable groups.
Causes of malnutrition in emergency situations.
Major deficiency diseases in emergencies.
Protein – energy malnutrition.
Specific deficiencies.

UNIT-III
Communicable diseases: Surveillance and treatment.
Control of communicable diseases in emergencies
Role of immunisation and sanitation.
Public nutrition approach to tackle nutritional problems in emergencies.

UNIT-IV
Assessment and surveillance of nutritional status in emergency affected populations.
Scope of assessment of malnutrition in emergencies.
Indicators of malnutrition clinical signs for screening acute malnutrition.
Anthropometric assessment of nutritimal status – Indicators and cut – offs indicating seriously abnormal nutrition situation weight – for – height based indicators, MUAC, social indicators.

Organization of nutritional surveillances and individual screening.

UNIT-V

Nutrition Relief and Rehabilitation

Assessment of food needs in emergency situations.

Food distribution strategy – identifying and reaching the vulnerable group – Targeting Food Aid.

Mass and supplementary feeding.

Special foods / rations for nutritional relief.

Local production of special foods.

Local food rehabilitation.

Organization of mass feeding / general food distribution

Feeding centers

Transportation and food storage.

Sanitation and hygiene

Evaluation of feeding programmes.

REFERENCES


ELECTIVE
PAPER – 4
FUNCTIONAL FOODS AND NUTRACEUTICALS

OBJECTIVES
To enable the students to gain:
- Knowledge on sources of Functional Foods and Nutraceuticals
- Knowledge on the role of functional foods, nutraceuticals and dietary supplements in health and disease

UNIT - I

UNIT- II
Classification - Based on food source, mechanism of action and chemical nature - isoprenoid, phenolic substances, fatty acids and structural lipids, terpenoids - saponins, tocotrienols and simple terpenes, carbohydrates and amino acid based derivatives, isoflavones.

UNIT- III
Functional foods of Microbial origin - Human gastrointestinal tract and its microbiota, functions, probiotic microflora and functions - Lactobacillus and Bifidobacterium, concept of probiotics and prebiotics with examples, role of probiotics in health and disease, spirulina as bioactive component.

UNIT – IV
Sources and role of Functional foods and Nutraceuticals - Role of functional foods and Nutraceuticals in diseases, concept of dietary supplements, phytochemicals, phytosterols, omega 3 and 6 fatty acids, dietary fiber, role of nutraceuticals in health and disease management – diabetes mellitus, hypertension, CVD, cancer; non essential nutrients as dietary supplements, FOSHU foods.

UNIT – V
Regulatory aspects - International and national regulatory aspects of functional foods in India, ICMR guidelines for Probiotics, development of biomarkers to indicate the efficacy of functional ingredients, Research frontiers in functional foods.
REFERENCES:


5. USFDA regulations on functional foods.

Journals

1. Journal of functional foods

2. Journal of free radical research
INTERNERSHIP

A phase of training where in a graduate is expected to conduct actual practice in a hospital industry/food industry according to his or her choice for a period of 30 Days so as to acquire job oriented skills.

Assessment:
Interns shall maintain a record book which shall be verified and certified by the training authority under whom he or she works during his/her internship period.

An objective evaluation of his/her knowledge, skills and attitude during training will be recorded by the center in-charge and monitored by faculty in-charge and marks shall be allotted accordingly.

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<td>Internal Assessment &amp; Viva Voce</td>
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OBJECTIVES
To enable the students to:

- Understand the principles of diet and Nutrition in the cause and treatment of disease.
- Understand the modifications in nutrients and dietary requirements for therapeutic condition.
- Learn recent concepts in dietary management of different diseases.

UNIT-I
Principle of Nutritional care, Types of hospital diets.

Nutrition Support Techniques, Enteral feeding - indications, Types - Nasogastric, Gastrostomy, Jejunostomy and Rectal feeding - requirements and advantages.

Parenteral feeding - Nutritional Support, Formula feeds and Complications in TPN.

UNIT-II
Diet in Febrile condition

Short duration - Typhoid, Influenza, Malaria, Long duration Tuberculosis.

Diet in deficiency diseases - PEM, Vitamin A, Anaemia

Surgery - Physiological response, Metabolic Consequences, Stage of Convalescence, pre and post operative diets.

Burns - Metabolic changes in protein and electrolytes and Nutritional support.

Diet in Energy Imbalance - Underweight and obesity, Etiology and dietary management.

Diet in allergy - Common food allergens, test for allergy - Skin test and Elimination diet and Treatment for allergy.

UNIT-III
Diseases of cardio vascular system - Risk factors of CVD, Etiology, Symptoms, and dietary management of atherosclerosis, Cerebral Infarction, Myocardial Infarction, prevention through life style modifications.

Classification, prevalence, Diet related factors influencing and dietary management of hypertension, dyslipidemia (Genetic Hyperlipidemia).
UNIT-IV
Diseases of the Gastro intestinal system- Disorders, Etiology, Symptoms and dietary management of Acute gastritis, Chronic gastritis, Peptic ulcer - duodenal & gastric Intestinal disease - Flatulence, Diarrhoea and Dysentry, Constipation, Celiac disease, Tropical sprue, Irritable bowel syndrome, diverticular disease, colon cancer, Ulcerative colitis.
Liver disease - Hepatitis, cirrhosis, Jaundice, fatty liver, cholecystitis and cholelithiasis, Hepatic coma.
Pancreas - Pancreatitis, Acute and chronic
Diabetes Mellitus - Etiology, Types, Symptoms, Diagnosis, metabolic alterations, complications and dietary management.

UNIT-V
Diseases of the Kidney - Etiology, Symptoms and Dietary modification, Nephritis, Nephrosis, Acute and chronic renal failure, Nephrolithiasis, Transplantation and dialysis, Dietary Modification.
Dietary modification and Nutritional Support for cancer, HIV, Alzheimer’s and Parkinson’s Disease.

REFERENCES

Journals:
2. The Indian Journal of Nutrition and Dietetics, Sri Avinashilingam Home Science College for Women, Coimbatore.
3. The American Journal of Clinical Nutrition Published by the American society for Clinical Nutrition, Inc., USA.
CORE PRACTICAL – III
NUTRITIONAL BIOCHEMISTRY

1. Determination of Saponification Number.
2. Determination of Acid Number
3. Determination of Reichert Meissl Number.
5. Estimation of Serum cholesterol - Zak’s method.

COMMUNITY NUTRITION

1. Development of a plan for nutrition education programmes in community.
2. Preparation of communication aids for different groups.
3. Development of low cost recipes for infants, preschoolers, elementary school children, adolescents, pregnant and lactating mothers
4. Planning and preparation of diet/ dishes for PEM, VAD and IDA
5. Field visits to ongoing national nutrition programmes
CORE PRACTICAL – IV

DIET THERAPY

1. Types of diet - Full liquid, clear liquid, soft, light, bland and regular diet.
2. Diet for - obesity, underweight, febrile conditions.
3. Diet in gastrointestinal disorders - peptic ulcer, diarrhoea, constipation.
4. Diet in liver disorders - jaundice, hepatitis, cirrhosis, hepatic coma, fatty liver and gall stones.
6. Diet in Diabetes mellitus - Type1, Type2 Diabetes mellitus, diabetes with complications.
8. Visit to a hospital to observe - Enteral Feeding and formula diet for tube feeding.
CORE PROJECT/DISSERTATION WITH VIVA VOCE

OBJECTIVES

An independent research work has to be undertaken by the students. The students will be guided and supervised by a member of the Teaching faculty of the concerned department. The Research can either be a survey or Laboratory oriented one. In which the research culminates should reflect the students own work. The Dissertation should be submitted at the end of the Semester.

Assessment

DISSERTATION: EVALUATION PATTERN

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ELECTIVE
PAPER – 5

FOOD BIOTECHNOLOGY

OBJECTIVES
Study of this paper will enable the students to

- Remain updated on recent advances in the application of genetic engineering in food.
- Develop an understanding about nano biotechnology in food industries.

UNIT I
Biotechnology – Introduction – biotechnological applications of animals, plants and microbes; concepts of genetic engineering and molecular cloning and their application in food production, transgenic plants, application of genetic engineering in food science and technology. Genomics, proteomics and bio informatics.

UNIT II

UNIT III
Application of biotechnology to food products: Yeast based processes and products – alcoholic beverages, industrial alcohols, bread and related products; Bacteria based processes and products – dairy products, fermented meat and fish products, fermented vegetable products, vinegar and other organic products, bacterial bio mass.

UNIT IV
Application of enzymes in food and beverages industries. Enzyme immobilization and its application in food industry: History, carrier materials, enzyme immobilization techniques, use of immobilized enzyme in food industries. Micro organism based products – sweeteners, flavours and amino acids, vitamin pigments, mushrooms, SCP.

UNIT V
REFERENCES:


