B.Sc. in Nutrition and Dietetics

Batch: 2018-20

COURSE STRUCTURE AND SYLLABUS

SHARDA UNIVERSITY
Beyond Boundaries

SCHOOL OF ALLIED HEALTH SCIENCES

SHARDA UNIVERSITY

1.TITLE: B.Sc. Nutrition and Dietetics

2. DURATION OF THE COURSE: 3 Years (6 semester)

3. YEAR OF IMPLEMENTATION

This syllabus will be implemented for the session 2019-20 onwards

4. PREAMBLE

Total Credits: 154

Total Number of Semesters: 6 (Two semesters per year)

Total Number of Theory Papers: 27

Total Number of Practical course: 15

Hospital posting: 2 Semester

Nutrition plays a primary role in growth, development, health, and fitness. Maintaining appropriate nutrition throughout life can prevent, or at least delay the onset of nutrition related diseases. Food is essential for our bodies to:

- Develop, replace, and repair cells and tissues;
- Produce energy to keep warm, move and work;
- Carry out chemical processes such as the digestion of food;
- Protect against, resist and fight infection and recover from sickness.

Vision :

The Department of Nutrition and Dietetics at Sharda University endeavors to achieve excellence in teaching and research for outreach to the community, industry and institutions to ensure promotive health for all.

Mission:

The Department of Nutrition and Dietetics strives to achieve academic excellence in the field of nutrition research and development. The aim is to train a cadre of professionals who work as teachers, researchers, public health nutritionists, dietitians, nutrition consultants, food quality control officers and experts in development of innovative food products. The larger objective is creation of nutrition awareness through community outreach for promotion of healthy lifestyle among the population.

Programme Educational Objectives:

PEO1 : To impart knowledge and develop capacities of the students in Clinical Nutrition.

PEO2 : To develop students to become health care professionals for services in various fields of clinical nutrition and related areas such as hospitals, academics, research, industry, community service.

PEO3 : To enable them to pursue higher education and research in Clinical Nutrition and Food Science

PEO4 : To enable the students to learn the methods of assessing human nutritional requirements,
nutritional assessment and diet planning for the community.

STRUCTURE OF COURSE

Course Code	Course Title	Total Number of Contact Hours				Credits
		L	T	P	Total Hours	
BND 106	HUMAN ANATOMY AND PHYSIOLOGY-I	4	2	-	6	6
BND 107	FUNDAMENTALS OF FOOD AND NUTRITION-I	3	1	-	4	4
BND 108	FAMILY FINANCE AND MEAL MAMAGEMENT	3	1	-	4	4
BND 116	ENVIRONMENTAL SCIENCE	2	1	-	3	3
BND 109	ENGLISH	2	1	2	4	4
BND 110	GENERAL PSYCHOLOGY-I	3	1	-	4	4
BND 156	HUMAN ANATOMY AND PHYSIOLOGY-I (LAB)	-	-	4	4	2
BND 158	FUNDAMENTALS OF FOOD AND NUTRITION (LAB)	-	-	2	2	1
	Total	**17**	**7**	**8**	**31**	**28**
Semester II						
BND 111	HUMAN ANATOMY AND PHYSIOLOGY -II	4	2	-	6	6
BND 118	FUNDAMENTALS OF FOOD AND NUTRITION	3	1	-	4	4
BND 119	NUTRITION IN LIFECYCLE	3	1	-	4	4
BND 114	PSYCHOLOGY-II	3	1	-	4	4
BND 117	APPLIED CHEMISTRY	3	1	-	4	4
BND 151	HUMAN ANATOMY AND PHYSIOLOGY -II (LAB)	-	-	5	5	2
BND 159	NUTRITION IN LIFECYCLE (LAB)	-	-	5	5	2
	Total	**16**	**6**	**10**	**32**	**26**
Semester III						
BND 212	FOOD SCIENCE-I	3	2	-	5	5
BND 213	BASIC DIETETICS AND COUNCELLING -I	3	1	-	4	4
BND 209	NUTRITIONAL BIOCHEMISTRY -I	2	1	-	3	3
BND 210	FOOD SAFETY	3	1	-	4	4
BND 211	COMMUNITY NUTRITION-I	3	2	-	5	5
BND 257	FOOD SCIENCE-I (LAB)	-	-	4	4	2
BND 258	BASIC DIETETICS AND COUNSELLING -I(LAB)	-	-	5	5	2
BND 259	NUTRITIONAL BIOCHEMISTRY -I (LAB)	-	-	2	2	1
	Total	**14**	**5**	**6**	**32**	**26**
Semester IV						
BND 213	FOOD SCIENCE- II	3	2	5	5	5
BND 214	NUTRITION BIOCHEMISTRY –II	2	1	-	3	3

BND 218	BASIC DIETETICS AND COUNSELLING -II	3	1	-	4	4
BND216	FOOD MICROBIOLOGY	3	1	-	4	4
BND219	TEXTILE AND CLOTHING	3	1	-	4	4
BND 260	FOOD SCIENCE-II(LAB)	-	-	5	5	2
BND 261	NUTRITION BIOCHEMISTRY- II(LAB)	-	-	5	5	2
BND 262	FOOD MICROBIOLOGY(LAB)	-	-	2	2	1
	Total	**14**	**6**	**12**	**32**	**26**
Semester V						
BND 311	THERAPEUTIC NUTRITION	3	1	-	4	4
BND312	PREVENTIVE NUTRITION	3	1	-	4	4
BND 313	FOOD SERVICE MANAGEMENT-I	3	1	-	4	4
BND 355	COMMUNITY POSTING	-	-	9	9	5
BND 355	CLINICAL POSTING	-	-	9	9	5
BND 351	THERAPEUTIC NUTRITION (LAB)	-	-	2	2	1
BND 356	FOOD SERVICE MANAGEMENT-I (LAB)	-	-	2	2	1
	Total	**9**	**3**	**22**	**34**	**24**
Semester VI						
BND 316	ADVANCED THERAPEUTIC NUTRITION	3	2	-	5	5
BND 317	FOOD SERVICE MANAGEMENT II	3	2	-	5	5
BND 318	FOOD PRESERVATION AND PACKAGING	3	1	-	4	4
BND 357	CLINICAL POSTING	-	-	10	10	5
BND 354	ADVANCED THERAPEUTIC NUTRITION (LAB)	-	-	2	2	1
BND 358	FOOD PRESERVATION AND PACKAGING (LAB)	-	-	5	5	3
BND359	FOOD SERVICE MANAGEMENT II (LAB)	-	-	2	2	1
	Total	**9**	**5**	**9**	**33**	**24**

Syllabus for

B.Sc. in Nutrition and Dietetics

(First Semester)

HUMAN ANOTOMY AND PHYSIOLOGY- I (BND-101)

L-4 T-2 P-4

Course Objectives: To understand the normal functioning of various organ systems of the body and their interactions and to be able to comprehend the pathophysiology of commonly occurring diseases

Course Learning Outcomes: Student will be able to –

1. Understand the current state of knowledge about the functional organization of the human body.

2. Develop insight of normal functioning of all the organ systems of the body and their interactions.

3. Comprehend the pathophysiology of commonly occurring diseases.

4. Correlate physiology with various disorders and their pathogenesis.

UNIT – I

Cells and its organelle – structure and functions, cell division. Tissues – structure and functions of various types of tissues.

Blood-functions, composition, RBC, WBC and platelet- functions. Blood volume, Blood coagulation, Blood group, Blood transfusion, Rh factor, Hematocrit value, Erythrocyte Sedimentation Rate, plasma proteins and lymph

UNIT-II

Défense mechanism of the body - Localization of infection, inflammation, immunity- types of immunity, cells of immunity, immunization, Antigen – Antibody interaction. Relationship between nutrients and immunity.

UNIT – III

Circulatory system – Heart- structure and functions, blood vessels, cardiac output and heart rate, cardiac muscle and their properties, cardiac cycle. Blood Pressure and Hypertension.

UNIT – IV

Respiratory system – Basic anatomy of respiratory system, functions, transport, and exchange of gases. Lung volume and lung capacity, mechanism of breathing. Anoxia and Dyspnea.

UNIT – V

Digestive system – Structure of GI tract. Saliva composition and functions, stomach- structure, functions and gastric juices- small intestine structure, functions and digestive juices, large intestine-structure and functions, pancreas-structure, function and pancreatic juice, liver and gall bladder -structure and functions, functions of bile Digestion, small intestine absorption and assimilation of food.

PRACTICAL PHYSIOLOGY

1. Microscope and its use.
2. Estimation of hemoglobin
3. Determination of RBC
4. Determination of WBC

PRACTICAL ANATOMY

1. Histology of types of epithelium
2. Histology of three types of cartilages and muscles
3. Demonstration of all bones and muscles of the human body
4. Demonstration of heart and vessels in the body
5. Demonstration of parts of digestive system
6. Demonstration of parts of digestive system

TEXT BOOKS

1. Text of physiology- A.K. Jain

2. Text of practical physiology- A.K. Jain

3. Human physiology- Chatterjee C.C.

4. Essentials of medical physiology- K.Sembulingam

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FUNDAMENTALS OF FOOD AND NUTRITION I

L 3,T 1, P 5

Course Objectives:

To understand the basic knowledge of food chemistry, nutritive value of different foods , and role of macronutrient for energy contribution in body.

Course Learning Outcomes:

After doing this course the student will be able to:

1. Knowledge of basic nutrients and their functions.
2. Understand critical periods in growth and development and impact of malnutrition.
3. Compare implications of poor dietary and lifestyle practices.

UNIT – I

Food Nutrition and Health- Functions of food, Nutrients and its classification, phytochemicals, food choices, good nutrition and malnutrition, definition of health

UNIT – II

- Food guide - Basic five food groups. How to use food guide (according to R.D.A.), food pyramid, RDA
- Use of food in body - Digestion, Absorption, transport & utilization.

UNIT – III

- Carbohydrates: Functions, classification, food sources, storage in body. Role of fibers in human nutrition.

UNIT IV

- Fats & oils: composition, saturated and unsaturated fatty acids, classification, food sources, function of fats.

UNIT – V

Proteins and amino acids- functions of proteins, classification of proteins, amino-acids and its classification, proteins in food, food sources of proteins, evaluation of protein quality, protein homeostasis

TEXT BOOKS

1. Nutrition Science- B.Srilakshmi
2. Text of Human Nutrition-Anjana Agarwal, Shobha Agarwal

PRACTICAL

1. Use and care of kitchen equipment.

2. Controlling techniques - Weights and measures standard, household measures for raw and cooked food.

3. Food preparation and classifying recipes as good, moderate or poor, sources of
Specific nutrients, Amount of ingredients to be in standard recipe -
a) Portion size -
b) Beverages - tea, coffee, cocoa, fruit juice, milk, milk shakes.
c) Cereals and flour mixtures - basic preparation & their nutritive value - boiled rice and rice pulao, chapati, puri, paratha, sandwiches

4. Vegetables & fruits -
Simple salads, Dry vegetables, Curries, fruits preparation using fresh and dried stewed fruit, fruit salad

5. Mix and milk products
Porridges, Curds, paneer and their commonly made preparations, Milk based simple desserts and puddings, custard, kheer

FAMILY FINANCE AND RESOURCE MANAGEMENT

Course Objectives: Top understand family values, income and imparting knowledge and skills needed to effectively manage resources.

Course Learning Outcomes The student will be able to

1. Make family budget, and get the information about savings.
2. Learn and apply first aid when ever needed.

UNIT-I

Family income and Expenditure – Concept of family income, meaning of household records. Money management: Types of income - management process applicable to money - planning, controlling and evaluating

Saving and investment- Meaning of saving need of saving, benefits of saving hearing of investment, methods of investment

UNIT-II

First Aids: Respiration and asphyxia, electrical injuries, wound and bleeding, Burns and scalds, emergency aids in schools, pressure points to stop external bleeding.

Health and Hygiene, Food borne infection and food poisoning, Food adulteration

UNIT-III

Basic Principles of Meal Planning- Meal Planning, Importance of meal planning, planning meal for family and its modification for special conditions.

UNIT- IV

PRINCIPLES OF RESOURCE MANAGEMENT Definition, Management Process - planning, controlling evaluating goals, values and standards.

Decision making: concepts, types of decisions, steps in decision making, methods of resolving conflicts. Resource Management - Classification, characteristics, factors affecting the use of resources.

Time management - Time norms, plans and time management.

Energy management - Fatigue - types and causes of fatigue - principles and techniques Mundel's class of changes - work simplification

UNIT-V

Consumer Education – Definition of consumer, problem faced by consumer, importance of consumer of education, rights & responsibility of consumer.

Consumer Aids- Different types of consumer aid

Environmental Science

L- 3 T-1 P-0

Unit – I: Introduction to Environmental Science and Chemistry

Environmental Sciences – Relevance, Significance, Public awareness, Forest resources, Water resources, Mineral resources, Food resources.

Ecosystem – concept, structure and function

Biodiversity – Definition, genetic, species and ecosystem diversity, Values and uses of biodiversity

Definition of Environmental Chemistry- Concept and Scope of Environmental Chemistry, Definition and description of various terms -Contaminant, Pollutant, Sink, Aerosols, RSPM, Particulate matter, DO, COD, BOD, Toxicology, Toxins, Hazardous chemicals, Carcinogens, Sewage, Affluent, Effluents, Potability etc.

Bio-geo chemical cycles in the environment: Carbon cycles, Oxygen cycle, Nitrogen cycles , Phosphorus cycles and Sulphur cycles.

Chemistry of ozone layer, Ozone depletion - Causes and effects, Green house effect, Major green house gases- Causes and effects, Global warming; Acid rain- Causes and effects.

Unit-II:Atmospheric Chemistry

Chemical composition of atmosphere- atmospheric water and CO_2; ions and radicals in atmosphere, formation of particulate matter, Photo-chemical and chemical reactions in the atmosphere, thermal inversion, particles in atmosphere; photochemical smog, acid rain, chemistry of ozone layer depletion; greenhouse gases and global warming.

Unit –III:EnergyResources and Conservation

Renewable and non-renewable energy resources, growing energy need, sun as source of energy, solar radiation and its spectral characteristics, fossil fuels classification, composition. Physico-chemical characteristics and energy content of coal, petroleum and natural gas. Principle of generation and conservation of conventional and non-conventional energy. Energy from biomass and biogas, anaerobic digestion, energy use pattern and future need projection in different parts of the world, energy conservation policies.

Unit-IV : Environmental Pollution

Environmental Pollution, Types and major sources of air pollutants, effects of air pollutants on physico-chemical and biological properties surrounding atmosphere, air born diseases and their effects on health. Types and major sources of water pollutants, effects of water pollutants on physico-chemical and biological properties of water bodies, water born diseases with special reference to water pollution. Types and major sources of soil pollutants, effects of soil pollutants on physico-chemical and biological properties of soil. Air, drinking water and waste water quality standard. Major sources of noise pollution, effects of noise pollution on health, noise level standard in industrial, commercial, residential and silence zones. Radioactive and thermal pollution sources and their effects on surrounding environment. Solid waste disposal and its effects on surrounding environment.

Unit-V:Instrumental techniques

Basic principle of Instrumentation and application of spectrophotometer – photometric laws – application of pH, conductivity meter.and turbidity meter.

PSYCHOLOGY-I

L-3 T-1 P-0

Objectives:

1. To help students understand the processes of emotion and relating them to diverse contexts.
2. To prepare students learn organizing their personal lives better by gaining insights into their own emotional strengths.

1. IntroductiontoPsychology

a. Schools:Structuralism,functionalism,behaviorism,Psychoanalysis.
b. Methods:Introspection,observation,inventoryandexperimental
c. Branches:purepsychologyandappliedpsychology
d. Psychology andpatient counselling

2. GrowthandDevelopment

a. Lifespan:differentstagesof development(Infancy, childhood, adolescence, adulthood, middleage, oldage).
b. Hereditvandenvironment:roleofhereditvandenvironmentinphysicalandpsychological development, "Naturev/sNurturecontroversy"

3.Sensation,attentionandperception

a. Sensation: Vision, Hearing, Olfactory, GustatoryandCoetaneoussensation, movement, equilibriumand visceral sense.
b. Attention:Typesof attention, Determinantsofattention (subjective determinantsand objective determinants)
c. Perception: Gestaltprinciplesoforganizationofperception(principleoffiguregroundand principlesofgrouping),factorsinfluencingperception (pastexperienceandcontext)
d. Illusionandhallucination:different types

4.Motivation
a. M o t i v a t i o n cycle(need, drive,incentive,
b. Classificationofmotives.
c. AbrahamMaslow'stheoryofneed hierarchy

5.Frustrationandconflict
a.Frustration:sourcesoffrustation
b. Conflict:typesofconflict.
c. Managementoffrustrationandconflict

English and Communication skills
(*Non-credit*)

THEORY

UNIT 1

Basic elements of grammar: Parts of speech, Articles: A, An , The; Tenses

UNIT 2

Vocabulary enhancement: Antonyms & Synonyms, Homophones, Homonyms

UNIT 3

Reading comprehension: Reading comprehension passage 1, Discussions Based on the text

Syllabus for

B.Sc. in Nutrition and Dietetics
(Second Semester)

HUMAN ANOTOMY AND PHYSIOLOGY- II

L-4 T-2 P-4

Course Objectives: To understand the normal functioning of various organ systems of the body and their interactions and to be able to comprehend the pathophysiology of commonly occurring diseases

Course Learning Outcomes: Student will be able to –

1. Understand the current state of knowledge about the functional organization of the human body.

2. Develop insight of normal functioning of all the organ systems of the body and their interactions.

3. Comprehend the pathophysiology of commonly occurring diseases.

4. Correlate physiology with various disorders and their pathogenesis

UNIT - I

Central nervous system – Anatomy and physiology of nervous tissue, neuron and neuroglia. Reflex action, reflex arc, synapse- definition. Structure and functions of Cerebrum, Cerebellum, Medulla oblongata and Hypothalamus.

UNIT – II

Excretory system – Kidney- structure and functions, formation of urine, composition of urine.

Sense organs – Structure and functions of eye, ear, nose, tongue and skin

UNIT – III

Endocrine glands – Anatomy and functions- Pituitary, Thyroid, Parathyroid, Adrenal and Islets of Langerhans.

UNIT – IV

Reproductive system – Anatomy of the male and female reproductive organs. Structure of Sperm, Menstrual cycle, Maturation of Graffian Follicle. Ovulation, Conception.

UNIT- V

Immune System

AMI and CMI, Innate and Aquired, Antigens and Antibodies, Helper T cells and Cytokines,.

PRACTICAL PHYSIOLOGY

1. Determination of blood group
2. Determination of bleeding time and clotting time
3. Determination of DLC
4. Estimation of Blood Pressure

PRACTICAL ANATOMY -

1. Histology of cerebrum, cerebellum and spinal cord
2. Demonstration of the parts of respiratory system
3. Demonstration of the parts excretory system

TEXT BOOKS

1. Text of physiology- A.K. Jain

2. Text of practical physiology- A.K. Jain

3. Human physiology- Chatterjee C.C.

4. Essentials of medical physiology- K.Sembulingam

FUNDAMENTALS OF FOOD AND NUTRITION II

L3, T 1, P0

Course Objectives:

To understand the basic knowledge of food chemistry, nutritive value of different foods , and role of micronutrients in body.

Course Learning Outcomes:

After doing this course the student will be able to:

1. Critically evaluate and derive requirements for specific macronutrients.

2. Understand critical periods in growth and development and impact of malnutrition.

3. Assess the nutritional status of children and adults.

4. Appreciate implications of poor dietary and lifestyle practices.

UNIT I: Role of mineral in body:

Minerals - macro & micronutrients. - Functions, Sources, Bioavailability and deficiency of Calcium, Iron, Iodine, Sodium & Potassium

UNIT II: Role of vitamins in body:

Vitamins (water & fat soluble) - definition, classification & functions of different types of vitamins and deficiency diseases caused by different vitamins

UNIT III

Water - as a nutrient, function, sources, requirement, water balance & effect of deficiency.

Electrolyte balance

Unit III: Nutrition and health status of the community

- Learning and Working with the Community
- Community Nutrition and Health
- Factors Influencing Community Health and Nutrition

Unit IV: Communication methods in nutrition

- Group Communication Methods
- Mass Communication Media
- Presentation of Selected Communication Media
- Non-Machine Media—Planning and Preparation
- Machine Operated Devices—Planning and Preparation

Unit V: Nutrition Programs

- Past Nutrition Programmes
- Nutrition Education Programmes-Planning, Implementation, and Evaluation
- **TEXT BOOKS**

1. Nutrition Science- B.Srilakshmi

2. Text of Human Nutrition-Anjana Agarwal, Shobha Agarwal

PSYCHOLOGY-II

L-3 T-1 P-0

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1.Emotions

a. Three levelsofanalysisofemotion (physiological level, subjectivestate, andovertbehaviour).
b. Theoriesof emotion
c. Stressandmanagementofstress.

2.Intelligence

a. Theoriesofintelligence.
b.Distribution ofintelligence.
c. Assessmentofintelligence

3.Thinking

a. R e a s o n i n g :deductive andinductive reasoning
b. Problemsolving: rules inproblemsolving(algorithmandheuristic)
c. Creativethinking:stepsincreativethinking,traitsofcreativepeople

4.Learning

a. Factorsaffectinglearning.
b. Theoriesoflearning: trialanderrorlearning,classicalconditioning,Operantconditioning, insight learning,social learningtheory.
c. The effectivewaystolearn: Massed/Spaced, Whole/Part, Recitation/Reading, Serial/Free recall, Incidental/Intentionallearning,Knowledgeofresults,association,organization,and mnemonicmethods.

5. Personality

a. Approaches t o p e r s o n a l i t y : type &trait, behaviourist, psychoanalytic and humanistic approach.
b. Personalityassessment:observation, situationaltest,questionnaire,rating scale,interview,and projective techniques.
c.DefenceM e c h a n i s m s : denial ofreality, rationalization, projection, reaction formation, identification,repression, regression,intellectualization,undoing,introjections,actingout.

Textbooks:

1. Feldman.R.H(1996).UnderstandingPsychology.NewDelhi:Tata McGrawhill.
2. Morganetal(2003). IntroductiontoPsychology. NewDelhi:TataMcGrawhill.
3. Lefton.Psychology.Boston:Alwin&BacotCompany.
4. Mangal, S.K(2002).AdvancedEducational Psychology.NewDelhi:prentice hall.
5. Atkinson(1996).Dictionary toPsychology

Applied Chemistry-II

L-2 T-1 P-0

Unit -I

Atomic Structure and Chemical Bonding

Atomic structure: Rutherford atomic model – Bohr theory of hydrogen atom – Sommerfeld theory - Particle and wave character of electrons – de Broglie's equation, Heisenberg's uncertainty principle, Schrödinger wave equation, quantum numbers – Pauli's exclusion principle –Orbits and Orbitals. Electronic configurations

Chemical Bonding: Types of bonds – ionic, covalent, coordinate, metallic and hydrogen bonds - conditions for the bond formation - concept of hybridization – hybridization involving s and p orbitals –

properties of ionic, covalent and coordinate compounds – valence bond theory – VSEPR theory. Molecular orbital theory – molecular orbital configurations of simple homo nuclear diatomic molecules,Comparison between Valence bond theory and Molecular orbital theory.

UNIT – II

Chemical Kinetics and Thermodynamics

Chemical Kinetics :Order and Molecularity of a reaction, Derivation of First order rate equation, half-life period of first order reaction, determination of rate constant of hydrolysis of ester, Energy of activation, Catalysis,Industrial application of catalysts.

Thermodynamics: Definitions of thermodynamic terms : System, surroundings etc. Types of systems, intensive and extensive properties, State functions, Thermodynamic processes, concept of heat and work. Laws of thermodynamics and concepts of entropy, free energy, heat content and chemical potential.

First Law of Thermodynamics : Statement, definition of internal energy and enthalpy, Heat capacity, heat capacities at constant volume and pressure and their relationship, Joule's law – Joule-Thomson coefficient and inversion temperature.

Unit-III

Periodic Table and periodic properties

Periodic Table – Classification of elements and General characteristics of s, p, d and f block elements

Periodic properties: Ionic radii, Ionization potential, Electron affinity, Electronegativity. Variation of periodic properties in periodic table.

Unit-IV

Metallurgy, Acids and Bases, Concentration of solution and volumetric analysis

Metallurgy: Minerals and Ores, Ore Dressing - Types of ore Dressing- Froth Floatation process and Magnetic separation. Extraction of Aluminium and Iron metals from their ores.

Acids & Bases: Arrhenius, Bronsted-Lowry, and Lewis concept of acids and bases.

Molarity - normality - molality and mole fraction - their calculations – in solutions for primary and secondary standards. Calculation of equivalent weight of acid, base, oxidizing agent, reducing agent and salt.

Principle of Volumetric Analysis.

Unit-V

Basic concepts in organic and polymer chemistry

Concepts in organic chemistry: Classification of organic compounds - Nomenclature of organic compounds - Functional groups - Homologous series - IUPAC nomenclature of hydrocarbons.

Electron displacement effects - inductive - inductomeric - electromeric – mesomeric effect – resonance.

Polymers

Polymerization - Types of polymerization - Distinction between addition and condensation polymerization - free radical - cationic and anionic polymerizations - mechanism of preparation of polymers - addition polymers and condensation polymers with examples - Thermoplastic and thermosetting polymers

Nutrition In Life Cycle

L3, T1, P5

Objectives

To enable students to:

- Learn the principles of meal planning.
- Acquire knowledge on planning meals for different age groups.

Course outcome:

To understand the nutritional requirements in different stages of life and Nutrient calculation.

UNIT I:

Introduction of Nutrition , Functions of food, Classification of nutrients, Phytochemicals, Health.
Nutrition in pregnancy: Physiological changes, Relationship between maternal and foetal nutrition, Impact of nutritional deficiency on the outcome of pregnancy, Nutritional and food requirements, Dietary guidelines, Dietary problems, Complications of pregnancy, GDM.

UNIT II

Nutrition during Lactation: Structure of Breast, Physiology of lactation, Hormonal control of lactation, Nutritional and food requirements, Factors affecting volume & Composition of breast milk, Breast feeding and its advantages, Pre-term milk (PTM), Expressed Breast Milk (EBM), Drip Breast Milk (DBM), Common problems during breast feeding, Contraindications to breast feeding.

UNIT III

Nutrition during Infancy: Growth & development, LBW, Small for Gestational Age and Pre term baby, Nutritional requirements, IMS Act, Artificial feeding, Hazards of Bottle feeding, Feeding of the Preterm and LBW babies, Weaning, Feeding problems in weaning, Family Pot Feeding, Low cost supplementary foods, ARF.

UNIT IV

Nutrition during early childhood (Toddler/Preschool): Growth and nutrient needs, Food requirements, Dietary guidelines, Feeding problems, Nutrition related problems, Growth monitoring, Importance of growth charts, GOBIFFF.

Nutrition of school children: Nutritional and food requirements, Dietary guidelines, Importance of breakfast, Feeding problems, Packed lunch, School lunch programmes

UNIT V

Nutrition during adolescence: Growth and nutrient needs, Food requirements, Food habits and dietary guidelines, Nutritional problems, Nutritional programmes for adolescence.

Nutrition during adulthood – Reference man, Reference woman, Nutritional requirements, feeding pattern.

Geriatric nutrition: Process of ageing, Factors affecting food intake and nutrient use, Change in organ function with ageing, Nutrient needs, Nutrition related problems.

Practical:

Objective 1. To develop in students, the concept of portion sizes

2. To impart basic cooking skills and healthy cooking practices

Introduction to meal planning

Use of food exchange list

- Planning and preparation of diets and dishes for
- Young adult
- Pregnant and Lactating woman
- Preschool child
- School age child and adolescents
- Elderly

Suggested Readings

- Bamji, M.S, Reddy V. (1998), Text Book of Human Nutrition, Oxford & IBH Publishing Co, New Delhi.
- Gibney, M.J, Elia M Ljingquist. O (2005), Clinical Nutrition, Backwell Science Publishing Co.
- Robinson, C.H and Winely E.S, (1984). Basic Nutrition and Diet Therapy, Macmillian Pub. Co. New York.
- Swaminathan, M (2002) Food and Nutrition, Volume I, The Bangalore Printing and Publishing Company Ltd.
- Guthrie, H.A &Picciano, M.F (1995), Human Nutrition, Mosby Publishing Co, New York.
- Srilakshmi, B. (2005). Dietetics, 5th edition, New Age International Publishers, New Delhi.
- Wardlaw. G.M and Insel, P.M (1993). Perspectives in Nutrition 2nd edition, Mosby Publishing Co, London.

Syllabus for

B.Sc. in Nutrition and Dietetics
(Third Semester)

FOOD SCIENCE I

L3, T2, P4

Objectives

To enable the students to:

- To understand the raw and processed food commodities used in daily life.
- To discuss the qualities of available commodities and their suitability for different purposes.

Course Learning Outcomes :

The student will be able to understand:

1. Understand the chemistry of food components like proteins, carbohydrates and lipids.

2. Understand basic concepts of new food product development.

3. Enable to learn about the food additives that are relevant to processed food industry for shelf life extension, processing aids and sensory appeal.

UNIT I

Introduction to Food science: Objectives of cooking, Preliminary preparations, Cooking methods – Moist heat methods, Dry heat methods, Microwave cooking, Solar cooking.

UNIT II

Cereals and Pulses: Composition, Nutritive value and processing of wheat, rice, barley, rye, oats, millets and its products , convenient cereal products.
Cereal cookery : Gluten formation, Gelatinization and dextrinization.

UNIT III

Nuts andOil seeds: Composition and Nutritive value, Specific nuts and oilseeds, Toxic constituents.
Pulses: Composition and nutritive value, Digestibility of pulses, Processing, Toxic constituents, Pulse cookery.

UNIT IV

Fats and Oils : Composition and Nutritive value, Specific fats and oils, Refining and processing of edible oils, storage, Emulsions, Rancidity, Smoking point and Flash point.

UNIT V

Vegetables and Fruits: Vegetables - Composition and Nutritive value, Pigments, Selection and Storage, Vegetable cookery.

Fruits - Composition and nutritive value, selection, post harvest changes and storage, Ripening of fruits, Enzymatic and non enzymatic browning.

Suggested Readings

- Clarke. D, Herbert. E (1992).). Botton. E.R, (1999), Oils, Fats and Fatty Foods, their practical application, Biotech Publishing Company.
- Eckles C.H, Combs. W.B, Macy. H (1998). Milk and Milk Products, MC Graw Hill Companies.
- Gopalan. C, Ramashathri V.V, Balasubramanyan S.C (1996), Nutritive Value of Indian Foods, National Institute of Nutrition, ICMR.
- Manay N.S, Shadaksharaswamy. M (2005), Foods – Facts and Principles. New Age International Publishers.
- Matz. S.A (1996). The Chemistry and Technology of Cereals and Food of Feed; Chapman and Hall, New York.
- Peckham C.G, Greaves H.T (1979). Foundation of food preparations, Mac Millan Publishing Co, New Delhi.

Practical:

1) Determination of acidity in given sample
2) Physical examination of various food grains
3) Determination of moisture content
4) Determination of gluten content
5) Determination of the taste threshold for the different sensations- sweet and salty
6) Detection of adulteration in different samples.
7) Study the effect of various additives on the stability of egg white foam.

FOOD SAFETY

L3, T 1, P0

Objectives

To enable the students to acquire knowledge on:

- Food safety,hygiene and food hazards
- Food regulations (national as well as international)
- Design and implementation of food safety management systems such as ISO series, HACCP and its prerequisites such as GMP, GHP etc.

Course Learning Outcomes

The student will be able to understand:

- Food safety, sanitary procedures,
- Food borne illness and their remedies

UNIT I

Introduction to Food Safety: Definition, Types of hazards and their impact on health, biological, chemical, physical hazards, and their control measures, Factors affecting Food Safety, Hygienic Food Handling, Purchasing and Receiving Safe Food—Important points to be observed for receiving various foods.

Sanitary procedures while preparing, cooking and holding food, Safety of left over foods, Food Storage- Guidelines for storage of foods at various temperatures, Storage of Specific Foods.

UNIT II

Food Borne Illness and Food Hazards

Food borne illnesses caused by Bacteria, Virus and Parasites. Natural toxicants in foods, Chemicals, Antibiotics, Hormones and Metal contamination.

UNIT III

Food Safety Management: Basic concept, Prerequisites - GHPs, GMPs and

SSOPs , HACCP, ISO series, TQM - concept and need for quality, components of TQM, Kaizen. Risk Analysis, Accreditation and Auditing (in brief)

Safety concerns in food packaging: Principles in the development of safe and protective packaging , Product labeling, Nutritional labeling and safety assessment of food packaging materials.

UNIT IV

Food laws and Standards**:** Indian Food Regulatory Regime, Global Scenario, Other laws and standards related to food, FPO, PFA, FSSAI, AGMARK, BIS.

GRAS and permissible limits for chemical preservatives and legal aspects for γ- irradiations.

Recent concerns in food safety: New and Emerging Pathogens. Genetically modified foods / Transgenics / Organic foods. Newer approaches to food safety.

UNIT V

Waste product handling: -

a. Planning for waste disposal.

b. Solid wastes and liquid wastes.

Suggested Readings

- Lawley, R., Curtis L. and Davis,J.(2004) The Food Safety Hazard Guidebook , RSC publishing.
- De Vries. (1997) Food Safety and Toxicity, CRC, New York.
- Marriott, Norman G. (1985). Principles of Food Sanitation, AVI, New York,
- Forsythe, S J. (1987) Microbiology of Safe Food, Blackwell Science, Oxford, USA.
- Roday .S. (1999) Food Hygiene and Sanitation, Tata McGraw-Hill company Limited, New Delhi.

NUTRITIONAL BIOCHEMISTRY-1

Course Objectives: The aim of the practical is to understand principle and preparation of buffer solutions , understand various methods of quantitative estimations of biomolecules and gain information on various blood analysis tests.

Course Learning Outcomes: Student will be able to

1. Gain skill on preparation of buffers
2. Learn DNA and RNA estimation in solutions
3. Comprehend the application of chromatography and electrophoresis in biochemistry
4. Knowledge on blood analysis

1. **Nutrition**
2. **Carbohydrate Chemistry**
3. **Enzymes kinetics and clinical enzymology**
4. **Hormone Action**
5. **Blood and Urine chemistry**
6. **Carbohydrate digestion, absorption and metabolism**
7. **Biological oxidation**
8. **Preparation of reagents**

Practical:

1. Preparation of reagents, buffer solutions and checking of pH
2. Qualitative analysis of Carbohydrates
3. Hydrolysis of sucrose
4. Colorimetry
5. Quantitative analysis of glucose

BASIC DIETETICS AND COUNSELLING-I

L3, T1,P5

- **Course Objectives:** To understand how Dietary Reference Intakes are derived for the population. To appreciate the role of nutrition in cellular and physical growth and assess nutritional status.
- **Course Learning Outcomes**: After doing this course the student will be able to:
- 1. Critically evaluate and derive requirements for specific macronutrients.
- 2. Understand critical periods in growth and development and impact of malnutrition.
- 3. Assess the nutritional status of children and adults.
- 4. Appreciate implications of poor dietary and lifestyle practices..

UNIT I

Dietitian and diet counselling: Role of Dietitian, specializations of dietitian, Nutrition and diet clinic, Patient check-up and Nutrition counselling- directive and non-directive, Strategies and goals of counselling and follow up. Psychology of feeding the patient.

Computer application: use of computers by Dietitian, Dietary computations, Dietetic management, education/training.

UNIT II

Basic concepts of Diet Therapy: Routine hospital diets - regular diets, clear fluid diet, full fluid diet, soft diet, Modified diets, Enteral and parenteral nutrition,

Diet in Infections and Fevers: Types, Aetiology, Metabolic changes, Dietary considerations in Typhoid, Influenza, Malaria, Tuberculosis, AIDS.

UNIT III

Diet in Obesity: Aetiology, Assessment, Types, Childhood and Adolescent Obesity, Complications, Management, and preventive strategies of Obesity.

Food exchange list – Definition, types, and significance.

UNIT -IV

Diet in Leanness: Aetiology, Nutritional requirement and Dietary management. Diet during eating disorders- anorexia, bulimia, binge eating.

UNIT V

Diet in Food Allergy and food intolerance (hypersensitivity): Definition, etiology, food allergens, symptoms and diagnosis of food allergies, nutritional management, restricted diets, elimination diets and hypo-sensitization, prevention of adverse food reaction. Skin disturbances: Types, symptoms, Diagnosis and Treatment.

Drug-Nutrient interactions (in brief)

Suggested Readings

- Antia P. Clinical Dietetics and Nutrition, 2nd edition, Oxford university press.
- Garrrow J.S, James W. P.T, Ralph A, (2000), Human Nutrition and Dietetics, 10th edition, Churchill Livingston, London.
- Guthrie H. A, Picciano M. F (1995), Human Nutrition, Mosby, St. Louis Missorie. Michael Sharon (1994), Complete Nutrition, Avery publishing group. New York.
- Mohan K. L, Krause M.V (2002), 2nd edition Food , nutrition and Diet Therapy, W.S. Suders Co, Philadelphia.
- Srilakshmi B, Dietetics (2006), New Age International Publishing Ltd.
- Robinson C.H., Lawler M.R, Cheweth W.L; and Gaswick A.E, Normal and Therapeutic Nutrition ,17th edition, Mac Milan Publishers.

PRACTICAL

1) Practical1: Preparation of a Ready – Reckoner for calculating portion volume, conversion of cooked to raw equivalent and nutrient content of various foods.
2) Practical 2: Planning using the Exchange List and the Food Composition Table and ready reckoner for healthy individual-– Vegetarian, NonVegetarian.
3) Practical 3: Market survey of different foods and their nutritional value per serving
4) Practical 4 Preparation of formulas for enteral feeding-Home based, combination feeds, supplement feeds.
5) Practical 5: Plan and prepare nutrient rich recipe -High protein Iron rich recipe
6) Practical 6: Planning and preparation of liquid diet
7) .

COMMUNITY NUTRITION

L3, T2, P0

Objectives

To enable the students:

- To understand the importance of nutrition in national progress and the significance of the assessment of nutritional status.
- To find solutions to overcome problems of malnutrition in the community.

Course Learning Outcomes: After doing this course the student will be able to:

1. Understand the concept and purpose of nutritional status assessment in community setting.

2. Explain nutritional concerns among vulnerable sections of the community and strategies to combat them.

3. Gain knowledge with regard to standard methods and techniques for assessing nutritional status.

4. Be familiar with the use of indices and indicators for screening and consequent identification of malnutrition in the community

UNIT I

Definition of Community – meaning of optimum nutrition, malnutrition – under nutrition and overnutrition.

Characteristics of community – Demography, vital statistics - IMR, MMR, NMR, Morbidity rate, Crude birth rate, Crude death rate, General fertility rate, Age specific fertility rate, Life expectancy.

Factors contributing to malnutrition in the community- Food habits, customs and practices, availability of food, socio- economic factors and housing and hygienic conditions. Inter - relationship between malnutrition, infection and poverty

UNIT II

Methods of assessment of nutritional status: Direct assessment and indirect assessment. Significance of nutritional assessment of community, improvement of nutrition of community, Importance of Antenatal and post-natal care.

UNIT III

Environmental Sanitation and safety I:

- Agents of contamination,
- Water safety and water disposal
- Personal Hygiene
- Public and home safety

UNIT IV

Food Borne diseases, food infections and intoxication

- Common Food Borne Diseases
- Parasitic Infection
- Food Infection and Intoxications

UNITV

Common Infectious diseases: Measles, Diphtheria, Malaria, Tuberculosis and others.

Suggested Reading

- Dandiya, P.C, Zafer, Z.Y.K and (2003), Health education and community pharmacy, Vallabh Prakashan Printers, New Delhi.
- Khader, V. (2003), Foods – Nutrition and Health, Kalyani Publishers, New Delhi.
- Park. K, (2005), Park's Textbook of Preventive and Social Medicine, 18th edition, BanarsidasBhanot Publishers, Jabalpur.
- Reddy, R.S. (1998), Nutrition Education, Commonwealth Publishers, New Delhi.
- Swaminathan, M. (2004), Food and Nutrition, Vol. II, 2nd edition, BAPPCO Publishers, Bangalore.
- Bamji, M.S, Rao, N.P and Reddy, V. (2003), Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
- Srilakshmi, B. (2004), Nutrition Science, New Age International Pvt. Ltd, New Delhi.

- Gibney, M.J, Margetts, B.M, Kearney, J.M and Arab, L. (2005). Public Health Nutrition, Blackwell Publishing, USA.
- Ramachandran, L. and Dharmalingam, T. (2005), Health Education, Vikas Publishing House Pvt. Ltd., New Delhi.

Syllabusfor

B.Sc. in Nutrition and Dietetics
(Fourth Semester)

FOOD SCIENCE II

Objectives

To enable the students to:

- To understand the raw and processed food commodities used in daily life.
- To discuss the qualities of available commodities and their suitability for different purposes.

Course Learning Outcomes:

The student will be able to understand:

1. Understand the chemistry of food components like proteins, carbohydrates and lipids.

2. Understand basic concepts of new food product development.

3. Enable to learn about the food additives that are relevant to processed food industry for shelf life extension, processing aids and sensory appeal.

UNIT I

Milk and Milk Products: Composition, Nutritive value, Processing- clarification, homogenization, pasteurization and freezing, Types of milk, Fermented and non-fermented milk products, Milk cookery.

UNIT II

Beverages: Tea, Coffee, Chocolate, fruit beverages, Milk beverages, carbonated beverages, Malted beverages, Non-alcoholic beverages and alcoholic beverages. Spices and condiments, raising agents.

UNIT III

Meat: Classification, structure, Composition and Nutritive value, Post mortem changes, Ageing, Tenderizing, Curing, Selection and storage, Meat cookery. Poultry: Classification, Processing, Composition and nutritive value, Storage.

UNIT IV

Fish: Classification, Composition and Nutritive value, Selection, Fish cookery, Storage

Egg: Structure, Composition and Nutritive value, Egg quality and evaluation, Egg cookery, Egg white foams, Iron sulphide formation.

UNITV

Sugar and related products: Nutritive value, Properties, Sugar related products, stages of sugar cookery, Crystallization, Crystalline and non-crystalline candies, Role of sugar in cookery.

Suggested Readings

- Clarke. D, Herbert. E (1992).). Botton. E.R, (1999), Oils, fats and fatty foods, their practical application, Biotech Publishing Company
- Eckles C.H, Combs. W.B, Macy. H (1998). Milk and Milk Products, MC Graw Hill Companies.
- Gopalan. C, Ramashathri V.V, Balasubramanyan S.C (1996), Nutritive Value of Indian Foods, National Institute of Nutrition, ICMR.
- Manay N.S, Shadaksharaswamy. M (2005),), Foods – Facts and Principles. New Age International Publishers.
- Matz. S.A (1996). The chemistry and technology of cereals and food of feed; Chapman & Hall, New York.
- Peckham C.G, Greaves H.T (1979). Foundation of food preparations, Mac Millan Publishing Co, New Delhi.
- Srilakshmi B (2011), Food Science, New Age International Publications, New Delhi.

FOOD SCIENCE PRACTICAL

Objectives

To enable the students to:

- Understand the effect of various cooking methods on different food groups.
- Understand the various methods of sensory analysis

Module I

a) Starch cookery

i) Gluten formation ii)Gelatinization temperature iii)Thickening power of starch

b) Sugar cookery

i) Stages of sugar cookery

Module II

a) Milk cookery

i) Curd formation ii) Scum formation

iii) Scorching of milk

b) Egg cookery

i) Characteristics of egg ii)Eggs cooked in shell

iii)Egg white foaming

Module III

Fruits and Vegetables

i)Darkening of fruits ii)Prevention of darkening

iii)Effect of acid and alkali on vegetable pigments iv)Blanching

Module IV

Sensory evaluation of foods: Sensitivity tests, Duo-trio test, Triangle test, Paired comparison test.

Suggested Readings

- Clarke. D, Herbert. E (1992) Botton. E.R, (1999), Oils, fats and fatty foods, their practical application, Biotech Publishing Company.
- Eckles C.H, Combs. W.B, Macy. H (1998). Milk and Milk Products, MC Graw Hill Companies.
- Gopalan. C, Ramashathri V.V, Balasubramanyan S.C (1996), Nutritive Value of Indian Foods, National Institute of Nutrition, ICMR.
- Manay N.S, Shadaksharaswamy. M (2005), Foods – Facts and Principles. New Age International Publishers.
- Matz. S.A (1996). The chemistry and technology of cereals and food of feed; Chapman & Hall, New York.
- Peckham C.G, Greaves H.T (1979). Foundation of food preparations, Mac Millan Publishing Co, New Delhi.
- Srilakshmi B (2011), Food Science, New Age International Publications, New Delhi.

NUTRITIONAL BIOCHEMISTRY-II

L-2 T-1 P-2

Course Objectives: The aim of the practical is to understand principle and preparation of buffer solutions , understand various methods of quantitative estimations of biomolecules and gain information on various blood analysis tests.

Course Learning Outcomes: Student will be able to

1. Gain skill on preparation of buffers
2. Learn vitamin and mineral estimation in solutions
3. Comprehend the application of chromatography and electrophoresis in biochemistry
4. Knowledge on blood analysis

1. **Lipid Chemistry, digestion and metabolism.**
2. **Amino-acid and Protein chemistry, digestion and metabolism.**
3. **Nucleic acid Chemistry and metabolism.**
4. **Vitamins**
5. **Mineral Metabolism.**
6. **Free radical chemistry**
7. **Hemoglobin andMyoblobin**
8. **Porphyria**

Practical:

1. Preparation of stock and working standard solutions of various concentration
2. Qualitative analysis of Protein
3. Qualitative analysis of Lipid
4. Determination of Absorption Maximum
5. Verification of Lambert-Beer's and Preparation of Standard Curve
6. Quantitative estimation of Total Protein
7. Quantitative estimation of serum creatinine

BASIC DIETETICS-II

L3, T1, P0

Course Objectives: To understand the nutrition assessment,

planning, implementation, monitoring and follow up in nutrition care process, the causative factors and metabolic changes in various diseases/disorders and acquire knowledge on the principles of diet therapy and comprehend principles of dietary counseling and the rationale of prevention of various diseases/disorders.

Course Learning Outcomes The student will be able to

1. Understand the importance of nutritional assessment in the care of patients.

2. Gain knowledge about causative factors and metabolic changes in various diseases/disorders and the associated principles of diet therapy.

3. Learn the principles of dietary counselling.

4. Comprehend the rationale of prevention of various diseases/disorders

UNIT I

Objectives of diet therapy – Principles of diet planning and counselling. Different types of diets, Vegetarian diets, Ketogenic diets, Glycemic Index of foods,Prebiotics, Probiotics,

Different types of feeding – Basic concepts of enteral feeding and parenteral feeding, formula feeds and complications. Pre-operative and post-operative diets.

UNIT II

Energy: Calorie Value and its measurement

Factors affecting calorie requirements

Effects of deficiency.

Respiratory diseases- Chronic pulmonary diseases, bronchitis, pneumonia, respiratory failure.

Musculo- Skeletal diseases- Osteoporosis, Arthritis- Rheumatoid and Osteo Arthritis.

UNIT III

Diet in Nutritional Deficiency: PEM, Anaemia, Xeropthalmia, Osteoporosis,

UNIT –IV

Water and electrolyte balance, Water requirements, Effect of deficiency

UNIT V

Diet in Hormonal Imbalances: PCOD, Hypothyroid, Hyperthyroid, Stress, and others.

Suggested Readings

- Antia P. Clinical Dietetics and Nutrition, 2nd edition, Oxford university press.
- Garrrow J.S, James W. P.T, Ralph A, (2000), Human Nutrition and Dietetics, 10th edition, Churchill Livingston, London.
- Guthrie H. A, Picciano M. F (1995), Human Nutrition, Mosby, St. Louis Missorie. Michael Sharon (1994), Complete Nutrition, Avery publishing group. New York.
- Mohan K. L, Krause M.V (2002), 2nd edition Food , nutrition and Diet Therapy, W.S. Suders Co, Philadelphia.
- Srilakshmi B, Dietetics (2006), New Age International Publishing Ltd.
- Robinson C.H., Lawler M.R, Cheweth W.L; and Gaswick A.E, Normal and Therapeutic Nutrition ,17th edition, Mac Milan Publishers.

PRACTICAL

Practical 7: Planning Ketogenic diet Preparing a very high fat and very low carbohydrate snack

Practical 8.Market survey of commercial nutritional supplements and nutritional support

Practical 9. Diet preparation for PEM

Practical 10. Diet preparation for Anaemia.

Practical 11: Diet preparation for xeropthalia and hormonal imbalances.

FOOD MICROBIOLOGY

L-3 T-1 P-2

Course Objectives:

The course aims to provide theoretical and practical knowledge about the micro-organisms involved in the food spoilage, infections and intoxications. The course also enables to understand the concept of preservation and microbiological safety in various food operations.

Course Learning Outcomes:

Student will be able to - 1. Understand the nature of microorganisms involved in food spoilage, food infections and intoxications.

2. Comprehend principles of various preservation and control techniques.

3. Understand microbial safety in various foods operations.

UNIT I

Introduction to Microbiology: Definitions of microbiology and microbes, Beneficial effects of microorganisms.

Microbial growth curve, Effect of intrinsic and extrinsic factors on growth curve: PH, Moisture, Temperature, Oxygen availability, Nutrients and others.

UNIT II

Microorganisms: General morphology, Characteristics, Reproduction, and Economic importance of:

A) Bacteria,

B) Fungus

C) Virus

D) Algae

E) Protozoa

UNIT III

Microbiology of Deficient Food: Spoilage, contamination sources, types, effect on thefollowing:

a. Cereal and cereal products

b. Sugar and sugar products.

c. Vegetables and fruits

UNIT IV

Microbiology of Deficient Food: Spoilage, contamination sources, types, effect on thefollowing:

d. Meat and meat products.

e. Fish, egg and poultry, Milk and milk products

g. Canned foods.

UNIT V

Environmental Microbiology:

a. Water and water borne diseases.

b. Air and air borne diseases.

c. Soil and soil borne diseases.

d. Sewage and diseases.

TEXT BOOKS

1. West BB wood L. Harger –VT Food Service in institution, John Wiley 1977.
2. Karls.L Quantity Food Sanitation, John Wiley, 1973
3. Frazier WC, Food Microbiology, McGreen Hill Book, Cot 195X.
4. Sullia SB and S Shantharam General Microbiology" Oxford and IBH Publishing Ltd., 1998.

PRACTICAL

1. Study of equipment in a microbiology lab.
2. Preparation of laboratory media and special media, cultivation of bacteria, yeasts and moulds.
3. Staining of bacteria: gram-staining.
4. Cultivation and identifications of important molds and yeast in food items.
5. Demonstration of available rapid methods and diagnostic kits used in identification of microorganisms or their products.
6. Visits (at least two) to food processing units or any other organization dealing with advanced methods in food microbiology.

Clothing and Textile
L 3, T 1
UNIT I
Principle of clothing
Clothing construction

UNIT II
Textile designing: Principles and concepts

UNIT III
General properties and fine texture of all textile fibres
Processing and manufacturing of all natural and manmade fibres

UNIT IV
Textile designing: Principles and concepts
Fashion Design: Fashion cycles, Business and Merchandising

UNIT V
Definition and classification of Yarns, Identification of Yarns, and its uses in various fabrics.

Syllabusfor

B.Sc. in Nutrition and Dietetics

(Fifth Semester)

THERAPEUTIC NUTRITION

L-3 T-1 P-2

Course Objectives: To understand the nutrition assessment, planning, implementation, monitoring and follow up in nutrition care process, the causative factors and metabolic changes in various diseases/disorders and acquire knowledge on the principles of diet therapy and comprehend principles of dietary Counselling and the rationale of prevention of various diseases/disorders.

Course Learning Outcomes: The student will be able to

1. Understand the importance of nutritional assessment in the care of patients.
2. Gain knowledge about causative factors and metabolic changes in various diseases/disorders and the associated principles of diet therapy.
3. Learn the principles of dietary Counselling.
4. Comprehend the rationale of prevention of various diseases/disorders.

UNIT I

Diet in Gastrointestinal disease: Aetiology, Symptoms and dietary management of Oesophagitis, Gastro Oesophageal Reflux Disease (GERD), Dyspepsia, Gastritis, Peptic ulcer, Constipation, Diarrhoea, Ulcerative colitis, Flatulence, Irritable bowel syndrome, Inflammatory bowel disease, Diverticulitis

Malabsorption syndrome – Lactose intolerance, Steatorrhoea, Celiac disease, Tropical sprue.

UNIT II

Diet in Diabetes Mellitus: Types, Aetiology, Symptoms, factors affecting normal blood sugar level, Diagnosis, Treatment, Dietary modifications, food exchange system, Glycemic Index, Glycemic load, Complications of diabetes, Nutrition in complication of diabetes, hypoglycemicagents and supportive therapy.

UNIT III

Diet in Cardiovascular diseases:Aetiology, Symptoms, Risk factors, pathophysiology, dietary management and prevention of Atherosclerosis, Coronary Artery Disease
Role of Functional foods in preventing Cardiovascular Diseases

Hypercholesterolemia, Hypertension – classification, sodium restricted diet, dangers of severe sodium restriction.

UNIT IV

Diet in Gout: aetiopathology, clinical features, complications and dietary management.

UNIT V

Diet in Inborn Errors of Metabolism : Phenylketonuria, Maple Syrup Urine Disease (MSUD), Tyrosinemia, Homocystinuria, Galactosemia.

Suggested Readings

- Mohan K. L. and Krause M.V (2002), 2nd edition Food , Nutrition and Diet Therapy, W.S. Suders Co, Philadelphia.
- Antia P. Clinical Dietetics and Nutrition, 2nd edition, Oxford University Press.
- Guthrie H. A, Picciano M. F (1995), Human Nutrition, Mosby, St. Louis Missionery.
- Sharon,M. (1994), Complete Nutrition, Avery publishing group. New York.
- Garrrow J.S, James W. P.T. and Ralph A, (2000), Human Nutrition and Dietetics, 10th edition, Churchill Livingston, London
- Robinson C.H, Lawler M.R, Cheweth W.L; and Gaswick A.E, Normal and Therapectic Nutrition ,17 th edition, Mac Milan Publishers.
- Bamji M.S. andVinodini Reddy (1998), Text Book of Human Nutrition, ford and IBH Publishing Co. Ltd New Delhi.

THERAPEUTIC NUTRITION PRACTICAL

Module I

Standardisation of portion sizes for different food preparations, use of weights and measures (raw weight v/s cooked weight), use of food composition table, menu planning and calculation

Planning and preparation of diet in cardiovascular diseases a)Hypertension
with obesity
b)CVD with Diabetes

Module II

Planning and preparation of diet in Diabetes:

1 NIDDM
2 IDDM
3 GDM

Module III

Planning and preparation of diet in gastrointestinal diseases

1 Lactose intolerance with PEM and aneamia
2 Constipation
3Peptic ulcer with Diarrhoea

Suggested Readings

- Bhala S.M.L, Bhatia N, Gopinath. Diet Manual for heart patient, CTC, AHMS, New Delhi (1983)
- Gibney M.J, Elia M Ljingquist. O (2005), Clinical Nutrition, Backwell Science Publishing Co.
- Robinson C.H and Winely E.S, Basic Nutrition and Diet Therapy 5thed, Macmillian Pub. Co. New York (1984)
- Swaminathan M (2002) Food and Nutrition, Volume I, The Bangalore Printing and Publishing Company to Ltd.

PREVENTIVE NUTRITION

Course Objective: To familiarize students with recent advances in nutraceuticals.

3. To impart knowledge on the health benefits of nutraceuticals and functional foods.

Course Learning Outcomes: The student will be able to

1. Understand the functional foods and their uses.
2. Comprehend the rationale of prevention of various diseases/disorders using nutraceuticals.

UNIT I

Functional foods-: Definition, Relation of functional foods & Nutraceutical (FFN) to foods & drugs. Applications of herbs to functional foods. free radicals, antioxidants, phytochemicals, prebiotics, probiotics and symbiotic. Fibre – classification, role, physiological and metabolic effect, Role of fibre in prevention of diseases.

UNIT II:

Introduction to Nutraceuticals as Science:

Historical perspective, classification, scope &future prospects. 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 III:

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.

UNIT IV:

Nutritional Genomics - I: Production technology for recombinant therapeutic products using E.coli with examples like human insulin, growth hormones, interferons, erythropoietin

Immunization – Significance, immunization schedule for children

UNIT V:

Perspectives in preventive nutrition- fortification, enrichment, restoration, health supplements and proprietary foods, Nutrigenomics.

Biomolecules as antibiotics, vitamins, pigments.

Suggested Readings

- Leathers, H.D. and Fosters, P., The World Food Problem: Tackling the Causes of Undernutrition in the Third World, 3rd Edition. Lynne Rienner Publishers, 2004.
- Southgate, D., Graham, D.H. and Tweeten, L., The World Food Economy, Blackwell Publishing, 2007.
- Wildman, R.E.C. (2007) Handbook of Nutraceuticals and Functional Foods, second edition. CRC Press.
- Goldberg I. *Functional Foods: Designer Foods, Pharma Foods*. 2004.
- Brigelius-Flohé, J & Joost *HG. Nutritional* Genomics: Impact on Health and Disease, Wiley VCH. 2006.
- Park. K, (2005), Park's Textbook of Preventive and Social Medicine, 18th edition, BanarsidasBhanot Publishers, Jabalpur.
- Lalitha. M, (1997), Major Issues in Food and Nutrition Science, Kanishka Publishers, New Delhi.
- Gibney, M.J, Margetts, B.M, Kearney, J.M and Arab, L. (2005). Public Health Nutrition, Blackwell Publishing, USA.

FOOD SERVICE MANAGEMENT-I

L-3 T-1 P-2

Objectives

To enable the students to:

- To develop skills in menu planning for quantity preparation.
- To understand the different styles of food service in volume feedings.

UNIT I

History and development of food service system: Food service establishments-history and development, factors affecting development, approaches to food service management, principles of management, functions of management

Planning a food service unit: the management process, types of plan, preparing a planning guide or prospectus

UNIT II

Entrepreneurship and food service management: entrepreneurship- characteristic of entrepreneur, creativity, innovation and entrepreneurship

Planning a food service unit: the management process, types of plan, preparing a planning guide or prospectus

UNIT III

Menu Planning: Importance of menu and menu planning, definition and functions of a menu, need for menu planning, knowledge and skills required for planning menu, types of menu, construction of menu, characteristic of good menu, evaluation of menu.

UNIT IV

Food Management : Purchase-Mode of Purchasing, methods of purchasing

Storage: Dry and low temperature storage, Store room management

UNIT V

Production Control: Use of standardized recipes, quality control in food preparation and cooking

Suggested Readings

- Anderson, F. (1996), Home Appliance Servicing Taraporwals Sons. & Co.
- Arora, K., (2002), Theory of Cookery, Frank Bros. & Co., Ltd., New Delhi. Berry, M., (1995), Complete Cook Book, Dorling Kindersley Ltd., London.
- Hsiung, D.T., (1994), Chinese Cantonese Cooking, Parragon Book Service Ltd., England.
- Johnson, J.B, (1995), Equipment for Modern Living, Macmillan company Ltd Khan, M.A. (1987), Food Service Operations, Avi Publishing Company.
- Lillicrap, D.K., (1989), Food and Beverage Service, 2nd edition, BLBS.
- Shiring, S.B., Jardine, R.W. and Mills, R.J (2000), Introduction to Catering, Thomson Asia Ltd., Singapore.
- Kinton, R. and Cesarani, V. (1999), The theory of catering, ELBS publishing.
- Varghese, B. (1999), Professional Food and Beverage Service Management, Macmillan India Ltd. Sethi, M and Malhan, S (1991), Catering Management, Wiley Eastern Ltd,

PRACTICAL

1) Quality cooking: concept, principles, and techniques
2) Planning and organization of meals for institutional feeding
3) Planning and organization for industrial catering
4) Catering for special occasions and events

COMMUNITY POSTING

2 Hours per week

Course Objectives: To familiarize the students with the concept of community health and nutrition. It will also expose the students to the prevalence of different nutritional problems.. The students will acquire knowledge about the various methods of nutritional assessment and public health aspects of malnutrition.

Course Learning Outcomes: Student will be able to –

1. Become familiar with the concept of Community nutrition.
2. Get exposure to the national healthcare delivery system.
3. Acquire knowledge about assessment of nutritional status of individuals and community.
4. Understand the public health aspects of malnutrition in the community.
5. Understand the concept of food and nutrition security.

CLINICAL POSTING

2hours per day

Course Objectives: To enable students to develop skill in nutritional diagnosis, planning and providing suitable preventive/ therapeutic diets for various diseases / disorders.

Course Learning Outcome: Student will be able to

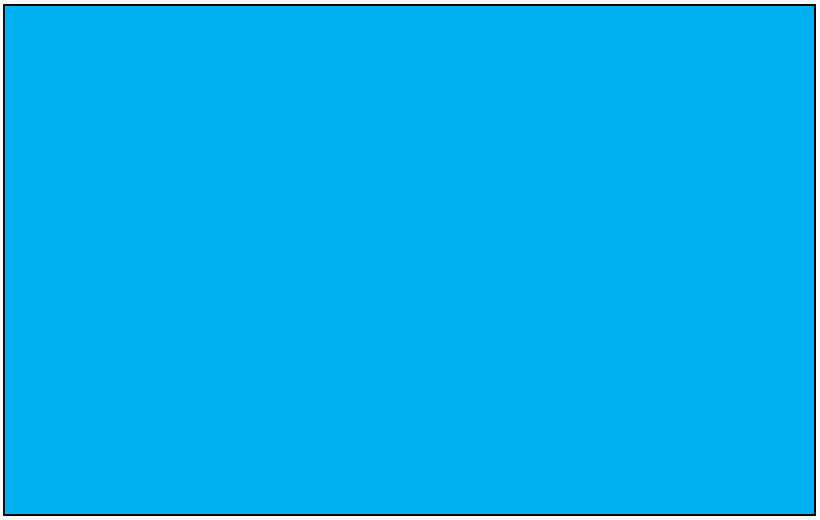
1. Develop skill in nutritional diagnosis, planning and providing suitable preventive/ therapeutic diets for various diseases / disorders

2. To provide effective dietary counseling for these disorders

3. To be aware of various commercial nutritional therapeutic products available in the market

Syllabusfor

B.Sc. in Nutrition and Dietetics
(Sixth Semester)



ADVANCED THERAPEUTIC NUTRITION

L3 T2,P2

Course Objectives: To understand the aetiology, physiological and metabolic anomalies and provide appropriate nutrition care for prevention and treatment of various disorders / diseases

Course Learning Outcome: Students will be able to

1. Develop a detailed understanding of the etiology, physiological and metabolic anomalies of various acute and chronic disorders / diseases
2. Demonstrate competency in nutrition assessment and diet history interview skills
3. Develop understanding and expertise on the effect of various disorders on nutritional status, nutritional and dietary requirements

4. Use critical thinking and clinical reasoning to develop nutritional care plan for prevention and treatment of various disorders / diseases

5. Apply the nutrition care process to the medical nutritional therapy of nutritionally vulnerable individuals using best evidence.

UNIT I

Nutritional Management in paediatric nutritional deficiency: PEM, Low birth weight, pre term baby, Vitamin A deficiency etc.

UNIT II

Diet in Diseases of Liver and Gall Bladder: Aetiology, Symptoms, Dietary treatment in Jaundice, Hepatitis, Pancreatitis, Cirrhosis, Hepatic Coma. Role of food and alcohol in developing liver diseses.

Biliary Tract Diseases- Cholecystitis, Cholelithiasis, and Choledocholithiasis .

UNIT III

Diet in Renal disease: Causes, Symptoms and dietary management in Nephritis, Nephrosis, Acute and chronic renal failure, Renal calculi, Acid and alkali producing foods, End Stage Renal Diseases (ESRD), Dialysis.

UNIT IV

Diet in Cancer: Tumor markers and their applications, Types of cancer, Risk factors, Symptoms, Metabolic alterations and Nutritional problems of cancer and cancer therapy, Medical Nutrition Therapy, Role of food in prevention of cancer.

UNIT V

Diet and drug interaction

Suggested Reading

- Gibney M J., Elia.M, Lingqvist. O (2005),Clinical Nutrition, Blackwell Science publishing Co.
- Guthrie, H.A and Picciano, M.F, (1995), Human Nutrition, Mosby Publishing Co, New York.
- Kris Etherton.PandBurus J.H.(1998), Cardiovascular Nutrition, American Dietetic Association ,Chicago, Illinosis.
- Kumar .P. Clark M (2005) , Clinical Medicine, 6th Edition, Elsevier Saunders Publishing Co.
- Nutrition and Changing Kidney Function, National Kidney Foundation New York.
- Patient Education Handbook- Diabetic Education (2000), Good Shepherd Medical Centre, Texas.

• Swaminathan, M (1989), Hand Book of Food and Nutrition, Bangalore Printing and Publishing Co, Bangalore.

PRACTICAL

ModuleI

Planning and preparation of diet in renal disorders

a) Glomerulonephritis
b) Acute renal failure
c) ESRD

Module II

Planning and preparation of diet in diseases of liver and pancreas a)Cirrhosis with Hypertension

b) Hepatitis
c) Pancreatitis

Module III

Planning and preparation of diet in cancer

FOOD SERVICE MANAGEMENT-II

L3, T2, P2

Course Objectives: To develop a knowledge base about the facilities required for different types of food service units and to equip individuals in understanding and managing resources in a food service institution

Course Learning Outcomes: Student will be able to:

1. Gain expertise to function as a food service manager.
2. Develop knowledge in managing various food service systems.
3. Understand and manage resources in a food service institution.
4. Provide practical experience in managing food material for food service management

UNIT I

Quality food production: Basic cookery processes and their application, cooking equipment

Types of Food Service system: Conventional, Commissary, ready prepared, assembly/serve,

UNIT II

Plant Sanitation and safety: Sanitation and safety definition, sanitation in food services, sanitizing agents, cleaning agents, sanitation and public health

Methods to was, rinse and sanitize food contact surfaces, post cleaning care, 3e's of safety, safety enforcement.

UNIT III

Personnel Management: Leadership

UNIT IV

Food management : components of a food service system

UNIT V

Methods of delivery service system

Different types of service in food service establishment

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Suggested Readings

- Anderson, F. (1996), Home Appliance Servicing Taraporwals Sons. & Co.
- Arora, K., (2002), Theory of Cookery, Frank Bros. & Co., Ltd., New Delhi. Berry, M., (1995), Complete Cook Book, Dorling Kindersley Ltd., London.
- Hsiung, D.T., (1994), Chinese Cantonese Cooking, Parragon Book Service Ltd., England.
- Johnson, J.B, (1995), Equipment for Modern Living, Macmillan company Ltd Khan, M.A. (1987), Food Service Operations, Avi Publishing Company.
- Lillicrap, D.K., (1989), Food and Beverage Service, 2nd edition, BLBS.
- Shiring, S.B., Jardine, R.W. and Mills, R.J (2000), Introduction to Catering, Thomson Asia Ltd., Singapore.
- Kinton, R. and Cesarani, V. (1999), The theory of catering, ELBS publishing.

• Varghese, B. (1999), Professional Food and Beverage Service Management, Macmillan India Ltd. Sethi, M and Malhan, S (1991), Catering Management, Wiley Eastern Ltd,

PRACTICAL

- Quality cooking: concept, principles, and techniques
- Planning and organization of meals for institutional feeding
- Planning and organization for industrial catering
- Catering for special occasions and events

FOOD PRESERVATION AND PACKAGING

L3 T2 P5

Objective:

To equip students with advanced knowledge of preservation and packaging of food

UNIT: 1

Introduction to food preservation –definition methods of food preservation , principles of food preservation

Packaging of foods – definition, Functions of packaging; Type of packaging materials; Selection of packaging material for different foods; Selective properties of packaging film; Methods of packaging and packaging equipment.

UNIT: 2

Dehydration and drying of food items:

Dehydration- definition and objectives, method of preservation, normal drying curve, water activity, factors affecting rate of drying, sun drying, types of dehydrators (air convection, drum, freeze and vacuum driers) steps in dehydration of fruits and vegetable

Packaging of dehydrated foods.

UNIT: 3

Preservation by high temperature : pasteurisation , sterilization

Canning: Preservation principle of canning of food items, thermal process time calculations for canned foods, spoilage in canned foods

Preservation by preservative : chemical preservative , natural preservatives .

Role of food packaging in food preservation, packaging of fruits and vegetables. Point to be considered before designing a packaging systems

UNIT: 4

Ionization radiation; Use of preservative in foods: chemical preservative, biopreservatives, antibiotics, lactic acid bacteria.

Innovative food packaging : types of packaging, MAP,CAP, active packaging , vacuum packaging , aseptic packaging , laws related to packaging .

UNIT:5

Preservation by low temperature :

Definition and objectives, difference between freezing and refrigeration, systems of refrigeration, slow freezing process, quick freezing process, method of preservation, steps in freezing fruits and vegetables, cryogenic freezing of fruits and vegetable, effect of freezing on nutritive value.

Practical's :-

Preservation of food products by using preservatives

Preservation of food product by using natural fermentation (sauerkraut preparation)

Preservation by high temperature

Text Books / References :

1. Technology of Food Preservation by Desrosier

2. Food Science by Potter

3. Fruits and vegetable processing by Cruss

4. Preservation of Fruits & Vegetables by IRRI

CLINICAL POSTING

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