

Faculty of Science

SRI DEV SUMAN UTTARAKHAND UNIVERSITY



Courses Offered

B.Sc. (NUTRITION & DIETETICS)
03 year (06 Semester)

DURATION OF COURSE :

- B.Sc. in Nutrition & Dietetics course will be a full time course .
- Duration will be three years divided into six semesters.

EXAMINATION :

- There shall be end of semester university examination at the end of each semester in the form of theory papers and practical examinations. The candidate shall be required to appear in every subject as specified in the course structure for each semester.

Duration of Examination :

- Each theory paper shall be of three hours duration.

Scheme of Examination :**B.Sc. in Nutrition & Dietetics (First Semester) University Examinations**

S. No.	Subjects	Subject code	THEORY MARKS				PRACTICAL MARKS				Total marks
			External Theory Exam	Internal Assessment	Total	Minimum marks	External Practical	Internal Assessment	Total	Minimum Marks	
1	Human Nutrition-1	BND-101	80	20	100	40	40	10	50	25	150
2	Human Physiology-1	BND-102	80	20	100	40	40	10	50	25	150
3	Food Science-1	BND-103	80	20	100	40	40	10	50	25	150
4	Communication Skills in English	COM-104	80	20	100	40					100
5.	Environmental Science	EVS-105	80	20	100	40					100
Grand Total											650

B.Sc. in Nutrition & Dietetics (Second Semester) University Examination

S. No.	Subjects	Subject code	THEORY MARKS				PRACTICAL MARKS				Total marks
			External Theory Exam	Internal Assessment	Total	Minimum marks	External Practical	Internal Assessment	Total	Minimum Marks	
1	Human Nutrition-2	BND-201	80	20	100	40	40	10	50	25	150
2	Human Physiology-2	BND-202	80	20	100	40	40	10	50	25	150
3	Food Science-2	BND-203	80	20	100	40	40	10	50	25	150
4	Meal Management through Life Cycle	BND-204	80	20	100	40					100
5.	Fundamentals of Computer	COM-200	40	10	50	40	40	10	50	25	100
Grand Total											650

B.Sc. in Nutrition & Dietetics (Third Semester) University Examination

S. No.	Subjects	Subject code	THEORY MARKS				PRACTICAL MARKS				Total marks
			External Theory Exam	Internal Assessment	Total	Minimum marks	External Practical	Internal Assessment	Total	Minimum Marks	
1	Nutritional Biochemistry	BND-301	80	20	100	40	40	10	50	25	150
2	Food Microbiology	BND-302	80	20	100	40	40	10	50	25	150
3	Applied Bakery	BND-303	80	20	100	40	40	10	50	25	150
4	Food Chemistry	BND-304	80	20	100	40					100
5.	Basic Dietetics	BND-305	80	20	100	40					100
Grand Total											650

B.Sc. in Nutrition & Dietetics (Fourth Semester) University Examination

S. No.	Subjects	Subject code	THEORY MARKS				PRACTICAL MARKS				Total marks
			External Theory Exam	Internal Assessment	Total	Minimum marks	External Practical	Internal Assessment	Total	Minimum Marks	
1	Advanced Dietetics	BND-401	80	20	100	40	40	10	50	25	150
2	Community Nutrition	BND-402	80	20	100	40	40	10	50	25	150
3	Food Processing, Preservation and Storage	BND-403	80	20	100	40	40	10	50	25	150
4	Institutional Food Service Management	BND-404	80	20	100	40					100
5.	Nutrition For Sports & Physical Fitness	BND-405	80	20	100	40					100
Grand Total											650

B.Sc. in Nutrition & Dietetics (Fifth Semester) University Examination

S. No.	Subjects	Subject code	THEORY MARKS				PRACTICAL MARKS				Total marks
			External Theory Exam	Internal Assessment	Total	Minimum marks	External Practical	Internal Assessment	Total	Minimum Marks	
1	Clinical Nutrition, Nutritional Assessment & Surveillance	BND-501	80	20	100	40	40	10	50	25	150
2	Entrepreneurship Development	BND-502	80	20	100	40	40	10	50	25	150
3	Modern Mathematics and Statistics	BND-503	80	20	100	40	40	10	50	25	150
4	Dietetics and Counselling	BND-504	80	20	100	40					100
5.	Food Standards and Quality Control	BND-505	80	20	100	40					100
Grand Total											650

B.Sc. in Nutrition & Dietetics (Sixth Semester) University Examination

S. No.	Subjects	Subject code	PRACTICAL MARKS	REPORT WRITING/ LABORATORY MANUAL MARKS	PRESENTATION MARKS	TOTAL MARKS
1	Practical Food Service Management	BND-601	150	50	-	200
2	Dietetic Food Development	BND-602	150	50	-	200
3	Internship/ In-Plant Training	BND-603	100	50	100	250
Grand Total						650

INTERNAL ASSESSMENT

- ❖ It will be for theory and practical both.
- ❖ It will be done through whole semester.
- ❖ Minimum 75% attendance is required to attempt the internal examinations.
- ❖ **Candidate must obtain at least 40% marks in theory and 50% marks in practicals respectively in internal assessment to be eligible for the annual university examination.**
- ❖ Internal assessment (Theory) will be done as follows :
 - a) Mid-term examinations = 15 marks
 - b) Assignments/Projects/Class test/Clinical Presentations = 05 marks

Total	= 20 marks
Internal assessment (Practical) will be done as follows:	
a) Laboratory manual	= 05 marks
b) Day to day performance	= 05 marks
c) Viva-voce	= 05 marks
d) Attendance	= 05 marks
Total	= 20 marks

CRITERIA FOR PASSING

1. A candidate is declared to have passed University examination in a subject, if he/she secures 40% marks in internal and external examinations individually.

DEGREE:

- ❖ The degree of B.Sc. in Nutrition and Dietetics course of the University shall be conferred on the candidates who have pursued the prescribed course of study for not less than three academic years and have passed examinations as prescribed under the relevant scheme.

COURSE OF STUDY

B.Sc. in Nutrition and Dietetics, Year- I(First Semester)

Sl.	Subjects	Teaching hours		
		Theory	Practicals	Total
1	Human Nutrition-1	40	20	60
2	Human Physiology-1	40	20	60
3	Food Science-1	40	20	60
4	Communication Skills in English	40	-	40
5	Environmental Science	40	-	40
Total				260

B.Sc. in Nutrition and Dietetics, Year- I(Second Semester)

Sl.	Subjects	Teaching hours		
		Theory	Practicals	Total
1	Human Nutrition-2	40	20	60
2	Human Physiology-2	40	20	60
3	Food Science-2	40	20	60
4	Meal management through life cycle	40	-	40
5	Fundamentals of Computer	40	20	60
Total				280

B.Sc. in Nutrition and Dietetics, Year- II(Third Semester)

Sl.	Subjects	Teaching hours		
		Theory	Practicals	Total
1	Nutritional Biochemistry	40	20	60
2	Food Microbiology	40	20	60
3	Applied Bakery	40	20	60
4	Food Chemistry	60	-	60
5	Basic Dietetics	40	-	40
Total				280

B.Sc. in Nutrition and Dietetics, Year- II(Fourth Semester)

Sl.	Subjects	Teaching hours		
		Theory	Practicals	Total
1	Advanced Dietetics	50	20	70
2	Community Nutrition	40	20	60
3	Food Processing, Preservation and Storage	50	20	70
4	Institutional Food Service Management	40	-	40
5	Nutrition For Sports & Physical Fitness	40	-	40
Total				280

B.Sc. in Nutrition and Dietetics, Year- III(Fifth Semester)

Sl.	Subjects	Teaching hours		
		Theory	Practicals	Total
1	Clinical Nutrition, Nutritional Assessment & Surveillance	50	20	70
2	Entrepreneurship Development	40	20	60
3	Modern Mathematics and Statistics	40	30	70
4	Dietetics and Counselling	40	-	40
5	Food Standards and Quality Control	40	-	40
Total				280

B.Sc. in Nutrition and Dietetics, Year- III(Sixth Semester)

Sl.	Subjects	Teaching hours		
		Theory	Practicals	Total
1	Practical Food Service Management	20	80	100
2	Dietetic Food Development	20	80	100
3	Internship/ In-Plant Training	-	360	360
Total				560

SYLLABUS
B.Sc. in Nutrition and Dietetics (First Year)
First Semester

Course Name : HUMAN NUTRITION-1
Course Code : BND-101T
Min. Hrs - Theory : 40 hrs

UNIT I: INTRODUCTION TO NUTRITION

Introduction to Nutrition: Food as a source of nutrient, functions of food, definition of Nutrition, nutrients, health. Nutritional status –optimum and malnutrition, RDA- Formulation of RDA and Dietary Guidelines- Reference Man and Reference women. Energy Balance, Assessment of Energy Requirements, Deficiency and Excess.

UNIT II: CARBOHYDRATES AND LIPIDS

Carbohydrates –Composition, classification, functions RDA, food sources.
Fats & Oils –Composition, classification, functions, RDA, food sources, essential fatty acids & effect of their deficiency.

UNIT III: PROTEINS

Proteins- Composition, classification, functions RDA, food sources and deficiency (in brief).

UNIT IV: MINERALS, TRACE ELEMENTS AND VITAMINS

Vitamins –Classification, sources, RDA, functions and deficiency(in brief) of the following:

Fat soluble : A, D, E & K

Water Soluble : B₁, B₂, Niacin, B₆, Folic acid and B₁₂.

Minerals –functions, sources, RDA and deficiency of the following – (in brief)

Calcium, Iron, Iodine, Fluorine, Sodium & Potassium).

UNIT V: WATER AND FIBRE

Water as a nutrient, functions, sources, requirement and effect of deficiency.

Fibre- types, Functions and Sources.

Course Name : HUMAN NUTRITION-1
Course Code : BND-101P
Min. Hrs - PRACTICAL : 20 hrs

1. Study of equipments and glassware in Food Analysis laboratory.
2. Analysis of following from foods:
 - a) Moisture
 - b) Ash
 - c) Crude Protein
 - d) Fibre
 - e) Fat
 - f) Vitamin C

Course Name : HUMAN PHYSIOLOGY -1

Course Code : BND-102T

Min. Hrs - Theory : 40 hrs

UNIT I: CELL & SKELETON SYSTEM

Cell- Structure and functions.

Skeleton system – Main bones of the body and their functions.

UNIT II: DIGESTIVE SYSTEM

Digestive System - Structure and functions of various parts of alimentary canal and digestive glands - Mouth ,buccal cavity ,pharynx , oesophagus ,stomach, small and large intestine and anus . Salivary Glands , liver ,pancreas ,gastric glands ,intestinal glands .

UNIT III: CIRCULATORY SYSTEM

Circulatory system - Structure and functions of heart, Blood-composition, functions and formation, blood vessels, blood pressure, blood groups, Rhesus factor, blood clotting and its significance, and ECG.

UNIT IV: RESPIRATORY SYSTEM

Respiratory system - Structure and function of respiratory system and tract ,nose trachea, larynx ,bronchi and lungs. Mechanism of respiration .

UNIT V: SKIN

Skin - Structure and functions of skin .

Course Name : HUMAN PHYSIOLOGY-1

Course Code : BND-102P

Min. Hrs - PRACTICAL : 20 hrs

1. Identification of bones of the Skeletal system.
2. Microscope and its use.
3. Microscopic study of different tissues- Epithelial, connective, muscular & nervous tissues.
4. Identification of blood cells by study of peripheral blood smear.
5. Measurement of pulse and blood pressure.
6. Estimation of haemoglobin.
7. Estimation of RBC, WBC, TLC, DLC and ESR.

Course Name : FOOD SCIENCE - 1

Course Code : BND-103T

Min. Hrs - Theory : 40 hrs

UNIT I: INTRODUCTION TO FOODS

Definition, functions, food groups, classification of foods. Study of different cooking methods, merits and demerits, Solar cooking, Microwave cooking. Cereals - Cereals and millets- breakfast cereals, cereal products, fast foods- structure, processing, use in variety of preparation, selection, variety, storage, nutritional aspects and cost.

UNIT II: PULSES

Pulses and legumes- Production (in brief), Selection and variety, storage, processing, use in variety of preparation, nutritional aspects and cost. Highlighting soya beans, lathyrism-removal of toxins.

UNIT III: MILK AND MILK PRODUCTS

Composition, classification, quality, processing, coagulation of milk, digestion of milk, storage, uses and cost. Nutritional aspects of milk, curd, butter, paneer, khoa, cheese, ice cream, kulfi and various kinds of processed milk.

UNIT IV: CONVENIENCE FOODS

Role, types, advantages, uses, cost and contribution to diet.

UNIT V: TEA, COFFEE, CHOCOLATE & COCOA,

Cultivation, processing, cost and nutritional aspects.

Course Name : FOOD SCIENCE-1

Course Code : BND-103P

Min. Hrs - PRACTICAL : 20 hrs

1. Familiarization with simple kitchen equipments and utensils, their use and care.
2. Preparation of various dishes using different types of cooking methods.
3. Preparation of Salads.(any two)
4. Preparation of Soups.(any two)
5. Preparation of Deserts.(any two)
6. Preparation of Cakes/Cookies.(any two)
7. Preparation of Main Course dishes.(any two)
8. Preparation of different convenience foods. .(any two)

Course Name : COMMUNICATION SKILLS IN ENGLISH

Course Code : COM-104T

Min. Hrs - Theory : 40 hrs

UNIT I: WRITING SKILLS-1

Vowels and Consonants, Sentences and its types, Parts of Speech- Noun, Pronoun, Adjectives, Verbs, Adverbs, Preposition, Conjunction, Interjection.

UNIT II: WRITING SKILLS -2

Verbs, Auxillary Verbs, Modals, Singular And Plural Verbs, Gender- Masculine And Feminine, Capitalisation Rules, Punctuations.

UNIT III: WRITING SKILLS-3

Active and Passive Voice, Direct and Indirect Speech, Articles, Tenses, Translation, Comprehension.

UNIT IV: READING SKILLS-1

Phonetics, types of sound- vowels, diphthongs and consonants.

UNIT V: READING SKILLS-2

Presentation and Questioning, Greetings and Introductions, Personal Interview.

Course Name : ENVIRONMENTAL SCIENCES

Course Code : EVS-105T

Min. Hrs - Theory : 40 hrs

UNIT-I INTRODUCTION

Multidisciplinary nature of environment, major areas of study in environmental studies, goals and objectives. Sustainable development.

UNIT-II ENVIRONMENT CLASSIFICATION, BIOGEOCHEMICAL CYCLE, ECOSYSTEM & BIODIVERSITY

Cycles – Carbon, Oxygen, Nitrogen, Sulphur & Phosphate.

Classification of environment- Lithosphere, Hydrosphere, Atmosphere & Biosphere.

Ecosystem- Structure, function, component, food chain, food web, ecological pyramid, succession, energy flow.

Biodiversity- Levels in biodiversity- Genetic, species, ecosystem, threats to biodiversity, IUCN Red data list, Hotspots, In-situ & ex-situ conservation, National park, wildlife sanctuaries, biosphere reserve.

UNIT-III POLLUTION

Air pollution, primary and secondary pollutants, major types of air pollutants and its effects, acid rain, ozone depletion, air pollution control methods.

Water pollution, definition, causes, waste water treatment process, rain water harvesting.

Soil pollution, soil profile, sources, soil degradation, effects of pesticide, biomagnifications, conservation process.

Solid waste management, definition, properties, treatment of solid waste, land filling, composting, incineration.

Hazardous waste pollution, definition, sources, effects & control methods.

Marine pollution and Thermal pollution.

Noise pollution, definition, causes & control, noise standards & limits.

UNIT-IV ENERGY RESOURCES

Introduction, types of energies- conventional - coal, petroleum, natural gas, nuclear power, thermal power; and non-conventional- solar, geothermal, wind, hydropower, tidal energy, biomass, hydrogen energy.

UNIT-V SOCIAL ISSUES AND MANAGEMENT

Acid rain, ozone depletion, global warming, Vienna convention, Montreal Protocol, Kyoto Protocol, Field work for social issues.

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

Course Name : HUMAN NUTRITION-2

Course Code : BND-201T

Min. Hrs - Theory : 40 hrs

UNIT I: CARBOHYDRATES & ENERGY

Carbohydrates - Digestion, absorption and metabolism, (aerobic and anaerobic), storage and utilization of carbohydrates.

Energy – Units of energy, energy value of food, Gross and physical energy BMR and factors affecting BMR.

UNIT II: LIPIDS

Lipids - Digestion, absorption and metabolism, Storage and mobilization of fat stores during exercise, ketone bodies.

UNIT III: PROTEINS

Proteins- Digestion, absorption and metabolism , Nitrogen balance and protein quality.

UNIT IV: MINERALS, TRACE ELEMENTS AND VITAMINS

Vitamins and Minerals- Digestion, absorption and metabolism, storage and utilization.

UNIT V: WATER AND FIBRE

Water and electrolyte balance – Water balance, Water and electrolyte losses, affect of low and high intake of electrolytes on water balance.

Fibre- digestion and metabolism.

Course Name : HUMAN NUTRITION-2

Course Code : BND-201P

Min. Hrs - PRACTICAL : 20 hrs

1. Use and care of kitchen equipments.
2. Weights and measures standard, household measures for raw and cooked food. Methods of measuring and weighing dry ingredients and liquids.
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, pastas, pancakes, cookies & cakes.
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, ice cream
6. Meat - cuts of meat -
Meat preparations, Poultry, Fish, hard and soft cooked, poached, scrambled, fried omlette & egg-nogs.

7. Soups - Basic, clear and cream soups.
8. Snacks- Pakoras, cheese toast, upma, poha, peanut, chikki, til & laddoo.

Course Name : HUMAN PHYSIOLOGY -2

Course Code : BND-202T

Min. Hrs - Theory : 40 hrs

UNIT I- Excretory system

Organs, structure and functions, ureter, urinary bladder, formation of urine, composition of normal urine

UNIT II Nervous System

Structure and functions of brain and spinal cord, reflex action.
Muscular system – Structure, types and Functions, muscular contraction and relaxation.

UNIT III Sense organs

- (i) Eye- structure and functions, physiology of vision and its defects.
- (ii) Ear – structure, functions; mechanism of hearing

UNIT IV Endocrine system

Hormones-endocrine glands- their structure and functions – pituitary, thyroid, parathyroid, adrenal, hormones of reproduction .

UNIT V Reproductive system

Female reproductive organs- structure and functions- ovary, fallopian tubes, uterus, vagina, external genitalia.
Male reproductive organs – structure and functions of testis, vas deferens, urethra, penis, prostate glands, menstruation, puberty, menopause, fertilization of ovum with sperm, placenta –its functions.

Course Name : HUMAN PHYSIOLOGY-2

Course Code : BND-202P

Min. Hrs - PRACTICAL : 20 hrs

1. Identification and study of structure of sense organs of the body.
2. Identification and study of the endocrine glands of the body
3. Identification and study of the female reproductive system.
4. Identification and study of the male reproductive system.
5. Identification and study of the various muscles of the body.
6. Identification and study of the excretory system.
7. Study of the nervous system.
8. Demonstration of Reflex action .

Course Name : FOOD SCIENCE -2

Course Code : BND-203T

Min. Hrs - Theory : 40 hrs

UNIT I: EGG, FISH, POULTRY AND MEAT

Selection, quality, purchase, storage, uses and nutritional aspects. Spoilage of egg, fish, poultry and meat.

UNIT II: VEGETABLES AND FRUITS

Variety, selection, purchase, storage, availability, cost, use and nutritional aspects of raw and processed vegetables and fruits. Effects of cooking on colour, texture, flavour, appearance and nutritive value.

UNIT III: SUGAR AND SUGAR COOKERY

Different forms of sugar (sugar, jaggery, honey syrup) manufactures, selection, storage and use as preservatives. Stages of sugar cooking.

UNIT IV: FATS AND OILS

Types of fats and oils (animal and vegetable), processing and changes (hydrogenation, rancidity, smoking point, emulsification), uses, storage, cost and nutritional aspects. Nuts and oilseeds: Nutritive value and toxins.

UNIT V: RAISING AGENTS AND FOOD ADJUNCTS

Raising agents - Types, constituents, uses in cookery and bakery, different types of cakes- sponge, chiffon and shortened cakes. Food Adjuncts - Spices, condiments, herbs, extracts, concentrates, essences and food colours- origin, classification, description uses, specification, procurement and storage.

UNIT VI- NUTRACEUTICALS AND FUNCTIONAL FOODS

Classification, composition, functions and sources.

Course Name : FOOD SCIENCE-2

Course Code : BND-203P

Min. Hrs - PRACTICAL : 20 hrs

Preparation of various recipes from different food groups:

1. Eggs

- a. Factors affecting whipping of egg white eg. Salt, Sugar, vinegar, fat and milk, temperature, type of container used and beaters.
- b. Poaching of eggs. c. Boiling of eggs.
- d. Coagulation of egg proteins – stirred and baked custards.
- e. Egg preparations – egg curry, spicy omelet, puffy omelet and French omelet, caramel custard (steamed), Scrambled eggs and fried eggs.

2. Vegetable Cookery

- a. Different methods of cooking vegetables – effect of shredding, dicing, acid and alkali, pressure cooking, steaming with and without lid. Eg. Potato, beetroot, carrot and greens.
- b. Vegetable preparations – potato methi curry, mashed potatoes, aloo tikke, vegetable kurma, carrot cucumber, ridge gourd and green gram dhal, tomato chutney and carrot halwa.

3. Fruits

Different ways of serving oranges, stuffed dates, banana fritters, fruit salad, stewed apricots, banana with custard, fruit jelly, grape jam, fruit punch, baked apple and pine apple upside down cake.

4. Sugar cookery

- a. Stages of sugar cookery.
- b. Preparations – vanilla fondant, chocolate fudge, coconut ice, gulab jamun, gujiya and marshmallow.

5. Fats and oils
 - a. Smoking Point – break cube test
 - b. Frying poories at different temperatures.
 - c. Preparation of mayonnaise.
6. Raising agents.
Sponge, chiffon and shortened cakes.

Course Name : MEAL MANAGEMENT THROUGH LIFE CYCLE
Course Code : BND-204T
Min. Hrs - Theory : 40 hrs

UNIT I: BASIC PRINCIPLES OF MEAL AND MENU PLANNING

Factors to be considered in meal/menu planning.

UNIT II: NUTRITION IN PREGNANCY AND LACTATION

Pregnancy - Physiological stages of pregnancy, nutrition requirements food selection and Complications of pregnancy.

Lactation - Physiology of lactation, nutritional requirements.

UNIT III: NUTRITION DURING INFANCY AND EARLY CHILDHOOD

Infancy - Growth and development, nutritional requirements, breast feeding, infant formula. Introduction of supplementary foods.

Early childhood. (Toddlers and Preschoolers) - Growth and nutrient needs, nutritional related problems, Feeding Pattern.

UNIT IV: NUTRITION FOR SCHOOL CHILDREN AND ADOLESCENCE

School children - Nutritional requirements, Importance of snacks, school lunch.

Adolescence - Growth, Nutrient needs, food choice, eating habits, factors influencing.

UNIT V: GERIATIC NUTRITION

Factors affecting food intake and nutrients use, nutrient needs, nutrition related problems.

Course Name : FUNDAMENTALS OF COMPUTER

Course Code : COM-200T

Min. Hrs - Theory : 40 hrs

Unit-I

Meaning and definition of computer, characteristics of computer, and basic applications of computer.

Unit-II

Components of a Computer System, Central Processing Unit, Visual Display Unit, Keyboard. Input and output devices, mouse, joy stick, scanner, microphone, OCR, MICR; light pen, bar code reader, digital camera, printer, speaker, plotter.

Unit-III

Concept of Memory, primary and secondary memory, RAM and ROM, units of memory – byte, kilobytes, megabytes, gigabytes.

Unit-IV

Storage devices, floppy disc, hard disc, CD ROM and DVD.

Unit-V

Computer languages, machine language, assembly language and high level language, role of assembler and compiler.

Course Name : FUNDAMENTALS OF COMPUTER

Course Code : COM-200P

Min. Hrs - PRACTICAL : 20 hrs

Practical:-

The practical examination will be taken from the entire syllabus given above.

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

Third Semester

Course Name: NUTRITIONAL BIOCHEMISTRY

Course Code : BND-301T

Min. Hrs - Theory : 40 hrs

UNIT- I- Basics of energy metabolism, nutrition & dietetics -

Unit of measuring energy, calorific value of food, BMR & factors affecting it, SDA of food, calculation of energy requirement, balanced diet, nutrition in health & diseases (protein energy malnutrition). Acid base balance concepts & disorders - pH, Buffers, Acidosis, Alkalosis

UNIT -II - Chemistry of carbohydrates & their related metabolism - Introduction, definition, classification, structure, biomedical importance Brief outline of metabolism :Glycogenesis & glycogenolysis (in brief), Glycolysis, citric acid cycle & its significance, HMP shunt & Gluconeogenesis (in brief), regulation of blood glucose level.

UNIT-III- Chemistry of Proteins & their related metabolism -

Amino acids - Definition, classification, structure, essential & non essential amino acids. Introduction, definition, classification, biomedical importance Metabolism : Transformation, Decarboxylation, Ammonia formation & transport, Urea cycle.

UNIT-IV- Chemistry of Lipids & their related metabolism -

Introduction, definition, classification, structure, biomedical importance, essential fatty acids, identification of fats & oils (saponification no, acid no, iodine no, acetyl no, reichert-miesel no. etc.)

Brief out line of metabolism :Beta oxidation of fatty acids, Ketosis, Cholesterol & it's clinical significance, Lipoproteins in the blood composition & their functions in brief, Atherosclerosis.

UNIT -V- Enzymes & Hormones -

Introduction, definition, classification, structure, coenzymes, isoenzymes, properties, factors affecting enzyme action, enzyme inhibition, diagnostic value of serum enzymes - Creatinine kinase, Alkaline phosphatase, Acid phosphatase, LDH, SGOT, SGPT, Amylase, Lipase, Carbonic anhydrase etc.

Classification, general mode of action, hormones of Pituitary, Thyroid, Parathyroid, Hormones- Adrenals, Reproductive Glands, Pancreas, hormonal disorders, counter regulatory hormones.

UNIT- VI- Vitamins & Minerals-

Water & fat soluble vitamins, structure, sources, requirement, deficiency disorders & biochemical functions. Macro- & Micro- Minerals.

UNIT - VII- Water metabolism-

Distribution of fluids in the body, ECF, ICF, Water metabolism, dehydration.

Course Name : NUTRITIONAL BIOCHEMISTRY

Course Code : BND-301P

Min. Hrs - PRACTICAL : 20 hrs

1. Identification of carbohydrates (Qualitative Tests)
2. Identification of proteins (Qualitative Tests)
3. To study general properties of the enzyme Urease.
4. To study the Achromatic time of salivary amylase.
5. Estimation of glucose in urine by Benedict's methods
6. Urine analysis - normal & abnormal constituents of urine.
7. Blood glucose estimation.

Course Name: FOOD MICROBIOLOGY

Course Code : BND-302T

Min. Hrs - Theory : 40 hrs

UNIT - I: INTRODUCTION TO MICROBIOLOGY

Introduction of microbiology and its relevance to everyday life. Brief history of microbiology - Louis Pasteur, Robert Koch, Edward Jenner. Pure culture techniques and maintenance of cultures.

UNIT - II: MORPHOLOGY OF MICROORGANISMS

Classification, growth and multiplication, growth curve. Effects of environmental factors on growth of microorganism - pH, water activity, redox potential, temperature, oxygen availability and nutrients present in the substrate.

Characteristics - Bacteria, Fungi - mucor, rhizopus, aspergillus, penicillium. Yeasts - saccharomyces. Algae - chlamydomonas, spirogyra. Animal viruses and Bacteriophages - classification and replication.

Protozoa - entamoeba histolytica, paramecium, plasmodium. Role of microorganisms in food processing and product development. Beneficial effect of bacteria, fungi algae and yeasts.

UNIT - III: MICROBIOLOGY OF DIFFERENT FOODS

Sources of contamination, effect, types and spoilage of: Cereal and cereal products like bread, flour and bakery products; Sugar and sugar products like honey, maple syrup and candies; Vegetables and fruits; Meat products like sausage, bacon and ham, fish, egg and poultry; Milk and its products; Canned foods. Microbial intoxication and infections: Food poisoning and food borne infection. Sources of contamination of food, toxin production and physiological action, sources of infection of food by pathogenic organisms, symptoms and method of control.

UNIT - IV: CONTROL OF MICROORGANISMS

Concepts of sterilization and disinfection, methods of sterilization and disinfection. Common disinfectants used in home and at industries. Tests to identify the effectiveness of sterilization and disinfection. Normal microbiological criteria for food consumption, testing milk and water for quality. Waste product handling :Planning for waste disposal, Solid wastes and liquid wastes.

UNIT - V: FOOD HYGIENE AND SANITATION

Importance of food hygiene and sanitation with relevance to food industry. Relevance of microbiology standards for food safety. General principles of food hygiene in rural and urban areas in relation to food preparation, processing, packaging, storage and transport and personal hygiene. Hygiene and sanitation with relevance to the physical structures of the site and building.

Course Name: FOOD MICROBIOLOGY

Course Code : BND-302P

Min. Hrs - Practical : 20 hrs

1. Study of equipments in a microbiology lab.
2. Microscopic identification of microorganisms (prepared slides).
3. Preparation of culture media and sterilization techniques.
4. Isolation of pure culture – Streak plate method, Serial dilution method.
5. Staining of bacteria – simple staining using Methyl violet, methylene blue, carbol fuschion.
6. Staining of Bacteria- gram staining.
7. Microbiological analysis of processed food and unprocessed food.
8. Testing quality of milk – Detection of Acidity (Clot on Boiling test, Alcohol test), Direct microscopic count, Standard plate count, Methylene Blue Reductase test, Phosphatase test, Turbidity test.
9. Cultivation and identifications of important molds and yeast in food items.
10. Visits (at least two) to food processing units or any other organization dealing with advanced methods in food microbiology.

Course Name: APPLIED BAKERY

Course Code : BND-303T

Min. Hrs - Theory : 40 hrs

UNIT-I BAKERY INDUSTRY

Current status, growth rate, and economic importance of Bakery Industry in India. Product types, nutritional quality and safety of products, pertinent standards & regulations.

UNIT II BREAD, BUNS AND PIZZA BASE

Ingredients & processes for breads, buns, pizza base, Equipments used, product quality characteristics, faults and corrective measures

UNIT III CAKES

Ingredients & processes for cakes, Equipments used, product quality characteristics, faults and corrective measures. Different types of icings.

UNIT IV BISCUITS, COOKIES & CRACKERS

Ingredients & processes, Equipments used, product quality characteristics, faults and corrective measures.

UNIT V MODIFIED BAKERY PRODUCTS

Modification of bakery products for people with special nutritional requirements e.g. high fibre, low sugar, low fat, gluten free bakery products.

UNIT-VI BREAKFAST CEREALS, MACARONI PRODUCTS AND MALT
Production and quality of breakfast cereals, macaroni products and malt.

Course Name: APPLIED BAKERY
Course Code : BND-303P
Min. Hrs - Practical : 20 hrs

1. Preparation of pizza base and assessment of its quality
2. Preparation of bread and assessment of its quality
3. Preparation of buns and assessment of quality
4. Preparation of butter cake and assessment of its quality.
5. Preparation of sponge cake with icing and assessment of its quality.
6. Preparation of cookies and assessment of quality.
7. Preparation of biscuits and assessment of quality.

Course Name: FOOD CHEMISTRY
Course Code : BND-304T
Min. Hrs - Theory : 60 hrs

UNIT-I- Water:

Definition of water in foods, structure, Sorption phenomenon, Water activity and packaging, Water activity and shelf-life interaction of water solute and food compounds, water activity and its influence on quality and stability of foods, methods for stabilization of food systems by control of water activity, sorption isotherm, colloidal properties of foods. Hydrogen ion concentration in food, oxidation reduction potential of foods and their applications in food systems.

UNIT-II- Carbohydrates:

Composition, structure and properties of different types of sugars, their application in food systems, crystallization, dextrinization, caramelization, Maillard reaction and its industrial application.

UNIT-III- Protein and Enzymes:

Iso-electric points of proteins, proteins as enzymes in food system, its nature, stability and action, proteolysis, application of enzymes and immobilized enzymes.

UNIT-IV- - Lipids:

Physical properties-melting point, softening point, specific gravity, • refractive index, smoke, flash and fire point, turbidity point. Chemical properties-reichert meissel value, polenske value, iodine value, peroxide value, saponification value. Effect of frying on fats. Changes in fats and oils- rancidity, lipolysis, flavor reversion. Auto-oxidation and its prevention. Technology of edible fats and oils- Refining, Hydrogenation and Interesterification.

UNIT-V- Vitamins and Minerals:

Structure ,Importance and Stability, Water soluble vitamins, Fat soluble vitamins
Major and minor minerals, Metal uptake in canned foods, Toxic metals.

UNIT VI: Pigments, Flavours and Browning reactions in food:

Food pigments-Introduction and classification (chlorophyll, carotenoids, anthocyanins and flavonoids, beet pigments, caramel). Definition and basic tastes, Chemical structure and taste, Description of food flavours, Flavour enhancers. Enzymatic browning, Non – Enzymatic browning, Maillard reaction, Caramelization reaction, Ascorbic acid oxidation.

UNIT VII: Physico-chemical and nutritional changes occurring during food processing treatments

Drying and dehydration, Irradiation, Freezing, Canning, New product development.

Course Name: BASIC DIETETICS

Course Code : BND-305T

Min. Hrs - Theory : 40 hrs

UNIT I: BASIC CONCEPTS OF DIET THERAPY

Therapeutic adaptation of normal diets. Principles and classification of therapeutic diets. Role of Dietician: Hospital & Community.

UNIT II: ROUTINE HOSPITAL DIETS AND FEEDING

Regular diet, light diet, soft diet, fluid diet. Enteral feeding - tube feeding. Parenteral Feeding - Central and peripheral.

UNIT III: ENERGY MODIFICATIONS AND NUTRITIONAL CARE FOR WEIGHT MANAGEMENT

Identification of overweight and obese- Aetiological factors contributing to obesity and prevention Treatment – Low Energy diets, behavioural modification. Complications of obesity. Underweight – aetiology and assessment. Treatment - high energy diets. Complications - Anorexia Nervosa, Bulimia.

UNIT IV: DISEASES OF THE GASTRO INTESTINAL TRACT

Etiologic factors, symptoms, diagnostic tests and dietary treatment for Esophagitis and hiatus hernia,

Diarrhoea and Constipation – high and low fiber diet. Gastritis, Peptic Ulcer and Ulcerative colitis.

Malabsorption Syndrome –Celiac Sprue – Gluten restricted diet, Steatorrhoea- MCT restricted diet.

UNIT V: MODIFICATIONS OF DIET IN INFECTIONS AND SURGERY

Fever and infections – aetiology, symptoms, diagnostic tests and dietary treatment – High Protein diet Surgical conditions – Pre- Operative and Post Operative conditions. Burns and Trauma – complications and dietary treatment. Diet in Allergy - Definition, Symptoms, diagnostic tests and dietary management in allergy. Elimination diet and desensitization.

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

Course Name: ADVANCED DIETETICS
Course Code : BND-401T
Min. Hrs - Theory : 50 hrs

UNIT I: DIET IN RELATION TO DEFICIENCY DISEASES

Pathogenesis and dietary management in Nutritional Anemia, PEM, Vitamin A deficiency.

UNIT II: DISEASES OF CARDIO VASCULAR SYSTEM

Aetiological factors, symptoms, diagnostic tests and dietary treatment for Atherosclerosis, Ischemic Heart Disease, Congestive Cardiac Failure, Hypertension, High fibre, low fat, Sodium restricted diet.

UNIT III: DISEASES OF THE KIDNEY

Aetiological factors, symptoms, diagnostic tests and dietary treatment for Acute and chronic Glomerulonephrities. - Low Sodium and low potassium diet. Nephrotic Syndrome. Gout. Acute and chronic Renal Failure- uremia. Nephrolithiasis and urolithiasis. Kidney transplantation and Dialysis. Use of Sodium and Potassium exchange lists.

UNIT IV: DISEASE OF THE PANCREAS AND LIVER

Diabetes Mellitus - Classification, Aetiological factors, symptoms, diagnostic tests, metabolic changes in the body, Insulin and oral hypoglycaemic drugs. Dietary Modifications with and without insulin, Complications of Diabetes, Food Exchange List. Glycemic Index and its use. Pancreatitis
Liver - Aetiological factors, symptoms, diagnostic tests and dietary treatment for Viral Hepatitis, Cirrhosis of the liver and liver encephalopathy – high carbohydrate diet. Cholelithiasis and cholecystitis – low fat diet

UNIT V: NUTRITION IN CANCER, AIDS, BURNS AND SURGICAL CONDITIONS

Aetiological factors, Symptoms, Diagnostic tests and Dietary Management.

UNIT VI: NUTRITION IN ALLERGY AND SKIN DISTURBANCES

Definition, classification, common food allergies and test and Dietary management.

Course Name: ADVANCED DIETETICS
Course Code : BND-401P
Min. Hrs - Practical: 20 hrs

1. Standardisation of common recipes.
2. Planning Of Diets:
 - a) Normal diet
 - b) Clear fluid diet, full fluid diet and soft diet.
 - c) High calorie diet for underweight and low calorie diet for overweight.
 - d) For peptic ulcer, constipation and celiac sprue.

- e) Anemia during pregnancy and anemia in a normal person.
- f) Hypertension and atherosclerosis.
- g) Nephritis, nephritic syndrome and nephrolithiasis.
- h) Diabetes Mellitus
- i) Gout
- j) Cirrhosis and viral hepatitis
- k) Cancer and AIDS.

Course Name: COMMUNITY NUTRITION

Course Code : BND-402T

Min. Hrs - Theory : 40 hrs

UNIT-I: INTRODUCTION TO COMMUNITY NUTRITION

Community nutrition programme planning - Identification of problem, analysis of causes, resources constraints, selection of interventions, setting a strategy, implementations and evaluation of the programme. Indicators of malnutrition Infant mortality rate, Child Mortality, Maternal mortality rate, Birth rate, Death rate. Identification of vulnerable groups -Pregnant women, Nursing mother ,Infants, Children ,Special emphasis to girl child (including adolescents) .

UNIT-II: NUTRITIONAL DISORDERS

Epidemiology, clinical features, prevention and dietary treatment for Protein Energy malnutrition, nutritional anaemias & vitamin deficiency disorders .

UNIT-III: METHODS OF ASSESSING NUTRITIONAL STATUS:

- a) Sampling techniques , Identifications of risk groups,
- b) Direct assessment - Diet surveys, anthropometric, clinical and biochemical estimation.
- c) Indirect assessment- Food balance sheet, ecological parameters and vital statistics.

UNIT-IV: IMPROVEMENT OF NUTRITION OF A COMMUNITY:

Modern methods of improvement or nutritional quality of food, food fortification, enrichment and nutrient supplementations. Nutrition education- themes and messages in nutrition and health, Antenatal and postnatal care.

UNIT-V: NUTRITIONAL AND INFECTION RELATIONSHIP:

Immunization and its importance, Food borne infection and intoxication diseases, foods involved, methods of prevention, Infestation of food borne diseases , Outbreak, Prevention signs and control of infection.

UNIT-VI: NATIONAL AND INTERNATIONAL AGENCIES

National and International agencies in uplifting the nutritional status in uplifting the nutritional status -WHO, UNICEF, FAO, CARE, ICMR, ICAR, ANP, VHAI, NIN, CSIR, CFTRI. Various nutrition related welfare programmes, ICDS, SLP, MDM, Prophylaxis programme and others (in brief).

Course Name: COMMUNITY NUTRITION

Course Code : BND-402P

Min. Hrs - Practical: 20 hrs

1. Diet and nutrition surveys.
2. Identification of vulnerable and risk groups.
3. Diet survey for breast-feeding and weaning practices of specific groups.
4. Use of anthropometric measurement in children.

5. Preparation of visual aids.
6. Field visit to Observe the working of nutrition and health oriented programmes (survey based result).
7. Field visit to Hospitals to observe nutritional deficiencies.

Course Name: FOOD PROCESSING, PRESERVATION AND STORAGE

Course Code : BND-403T

Min. Hrs - Theory : 50 hrs

UNIT I: PRINCIPLES OF FOOD PRESERVATION AND PROCESSING

Principles of Food Preservation and Processing, microorganisms associated with foods- bacteria, yeast and mold, Importance of bacteria, yeast and molds in foods. Classification of microorganisms based on temperature, pH, water activity, nutrient and oxygen requirements, typical growth curve of micro- organisms. Classification of food based on pH, Food infection, food intoxication, definition of shelf life, perishable foods, semi perishable foods, shelf stable foods.

UNIT II :METHODS – BY LOW TEMPERATURE

Freezing and Refrigeration :Introduction to refrigeration, cool storage and freezing, definition, principle of freezing, freezing curve, changes occurring during freezing, types of freezing i.e. slow freezing, quick freezing, introduction to thawing, changes during thawing and its effect on food.

UNIT III BY HIGH TEMPERATURE

Thermal Processing- Commercial heat preservation methods: Sterilization, commercial sterilization, Pasteurization, and blanching.

UNIT IV: BY MOISTURE CONTROL

Drying and Dehydration - Definition, drying as a means of preservation, differences between sun drying and dehydration (i.e. mechanical drying), heat and mass transfer, factors affecting rate of drying, normal drying curve, names of types of driers used in the food industry. Evaporation – Definition, factors affecting evaporation, names of evaporators used in food industry.

UNIT V: BY IRRADIATION & CHEMICALS

Introduction, units of radiation, kinds of ionizing radiations used in food irradiation, mechanism of action, uses of radiation processing in food industry, concept of cold sterilization.

Preservation with chemicals: Characteristics of chemical preservatives, Classification of preservatives, Pigments, Types and mode of action of organic and inorganic preservatives, uses, natural preservatives, antibiotics, antioxidant, anti-browning, cleaning, sanitizing and fungicidal agents – mode of action, uses. Health impacts use to excessive use of chemical preservatives.

UNIT VI: STORAGE OF FOODS

Course Name: FOOD PROCESSING, PRESERVATION AND STORAGE

Course Code : BND-403P

Min. Hrs - Practical: 20 hrs

1. Concept of shelf life of different foods
2. To study the concept of Asepsis and sterilization
3. Determination of pH of different foods using pH meter.

4. Prepare the following recipes – jellies, jams, squashes, pickles, dehydrated vegetables.
5. To perform blanching of different plant foods.
6. Preparation of ketchups & sauces.
7. Preparation of Chutneys, Chutney powder.
8. Preparation of Frozen fruits and vegetables.

Course Name: INSTITUTIONAL FOOD SERVICE MANAGEMENT

Course Code : BND-404T

Min. Hrs - Theory : 40 hrs

UNIT I: FOOD SERVICE INDUSTRY

Types of catering, History and development. Commercial: Hotels, motels, restaurants, clubs, cafeteria, franchise and chain hotels. Welfare: Hospitals, school lunch, residential establishments, industrial and philanthropic establishments. Transport: Air, Rail and Sea and Space. Miscellaneous: Contract and outdoor catering

UNIT II: FOOD SERVICE STYLES

Conventional, Commissary, assembly- line, table service, hatch and counter, cafeteria, banquet, buffet, Indian, western and oriented services.

UNIT III: PLANT LAYOUT, HYGIENE AND SANITATION

Layout of food service units – planning of areas as work units with relevant spacing. Equipment – major and minor – their selection, layout, use and care. Fuels. Hygiene and Sanitation - In food handling, plant, equipment, personnel, raw materials, and methods of work.

UNIT IV: ORGANISATION AND MANAGEMENT

Organisation and management - Types and tools – mainly related to food service units. Work simplification and motion study in work areas. Personnel Management – selection, induction, training supervision and dismissal. Legal controls – Labour laws and welfare measures.

UNIT V: FINANCIAL MANAGEMENT

Cost control – food costs, overheads and profits. Budgeting, books of account, inventories. Stores control, indents, Purchase.

Course Name: NUTRITION FOR SPORTS & PHYSICAL FITNESS

Course Code : BND-405T

Min. Hrs - Theory : 40 hrs

UNIT I: OVERVIEW OF NUTRITION FOR FITNESS AND SPORTS

Exercise for health promotion, Exercise guidelines, Factors affecting sport performance, Human energy requirements for exercise, Energy Systems for Endurance & Power Activity. Components of energy expenditure, Fatigue during exercise. Energy balance, body weight, Components of body composition, Techniques to assess body composition, Body weight management. Management of Fitness & Health, Physiological Aspects – Metabolic changes

during sports activity Effect of Specific Nutrients on Work Performance & Physical Fitness, Fuels for Muscle Contraction.

UNIT II: CARBOHYDRATES, FATS, PROTEINS AND EXERCISE

Carbohydrates- Nomenclature (types of CHO) and sources, Role of CHO in energy systems during exercise, Dietary CHO recommendations and strategies for exercise performance, CHO-related ergogenic aids

Fats- Nomenclature (types of dietary fats) and sources, Role of lipids in energy systems during exercise, Dietary fat recommendations and strategies for exercise performance, Lipid-related ergogenic aids, Cardiovascular disease.

Protein- Nomenclature (types of dietary proteins) and sources, Role of protein in energy systems during exercise, Dietary protein recommendations and strategies for exercise performance, Protein-related ergogenic aids.

UNIT III: FLUIDS AND EXERCISE

Fluid, electrolytes, temperature regulation and exercise, Body water components, Electrolytes and fluid balance, Heat impact on exercise performance, Guidelines and strategies during warm or hot conditions. Nutritional Requirements for Sports: Pre, During and Post Game (Short Duration, Endurance).

UNIT IV: ERGOGENIC AIDS, SUPPLEMENTS AND DRUGS IN SPORTS.

Ergogenic aids, Supplements in Sports, Vitamins and minerals of concerns in athletes, Drugs in sport and role of WADA. Nutrigenomics and sports, Special populations (examples older adults, vegetarians).

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

Course Name: CLINICAL NUTRITION, NUTRITIONAL ASSESSMENT & SURVEILLANCE

Course Code : BND-501T

Min. Hrs - Theory : 50 hrs

UNIT I GENERAL NUTRITION CARE, METABOLIC STRESS & CANCER

Diet, Nutrient and Drug interactions, Nutrition Support – Parenteral Nutrition.

Metabolic & clinical aberrations, diagnosis, complications, treatment, Medical Nutrition Therapy(MNT) and dietary counselling in Metabolic Stress -Surgery, Burns, Sepsis & Trauma. Critical care, Cancer- General & Specific cancers, Effect of Cancer therapy on MNT

UNIT II Gastrointestinal Tract Disorders :

Etiopathophysiology, metabolic & clinical aberrations, diagnosis, complications and recent advances in prevention, treatment, MNT and dietary counseling in GI Tract Disorders - Diverticular Diseases, IBD: Crohn's Disease & Ulcerative Colitis. Liver, Gallbladder and Pancreatic Disorders –Cirrhosis, Encephalopathy, Liver Transplant; Cholecystitis, Cholecystectomy; Pancreatitis.

UNIT III Diseases of Heart and Blood Vessels :

Etiopathophysiology, metabolic & clinical aberrations, diagnosis, complications and recent advances in prevention, treatment, MNT and dietary counselling in Hypertension, Myocardial Infarction, Congestive Heart failure, Coronary Bypass Surgery.

Unit IV Renal Disorders & Others

Etiopathophysiology, metabolic & clinical aberrations, diagnosis, complications and recent advances in prevention, treatment, MNT and dietary counselling in Nephrotic Syndrome, Glomerulonephritis, Acute Renal Failure, Chronic Kidney Disease, Dialysis, Transplant & Renal Stones. Gout.

Lung disorders: Bronchopulmonary dysplasia, COPD, Musculoskeletal & Rheumatic Disorders –Osteoporosis, Arthritis.

Unit V Pediatric Nutrition

Nutritional assessment of children, Management of severe acute malnutrition in children, Feeding problems of children with special health care needs – cleft palate, craniofacial anomalies, neurodevelopmental disorders, IBEM- PKU, MSUD, galactosemia, tyrosinemia, Cystic fibrosis, Congenital heart disease.

Unit VI: Nutritional Status Assessment And Surveillance

Meaning, need, objectives and importance. Community, regional, national and international surveillance systems.

Rapid Assessment Procedures- Need, importance, techniques, interpretation and steps in RAP.

Sources of secondary health data - sources of relevant vital statistics, importance of infant, child, maternal mortality rates, and epidemiology of nutrition related disease.

Course Name: CLINICAL NUTRITION, NUTRITIONAL ASSESSMENT & SURVEILLANCE

Course Code : BND-501P

Min. Hrs - Practical : 20 hrs

1. Market Survey for commercial nutritional therapeutic products & commercial nutritional products for physical fitness & sports performance available in India – critical evaluation.
2. Planning & preparation of diets for disorders covered in theory with introduction to mixed / multiple disorders and complications, using case study approach.
3. Diet counseling for disorders covered in theory & development of diet counseling aids.
4. Use of computers for the same.
5. Planning & preparation of diets for pediatric disorders.
6. Diet counseling for various disorders using diet counseling aids developed for the same and evaluating the efficacy of the counseling aids.
7. Project in the areas of nutrition assessment, community nutrition, therapeutic nutrition, diet counseling.

Course Name: ENTREPRENEURSHIP DEVELOPMENT

Course Code : BND-502T

Min. Hrs - Theory : 40 hrs

UNIT I: ENTREPRENEURSHIP

Definition - Characteristics of an entrepreneur, Entrepreneur & enterprise. Traits of a true entrepreneur, type of entrepreneur, functions of an entrepreneur, behavioural patterns of entrepreneur.

Entrepreneurial Motivation - Motivating factors, Facilitating factors, Achievement motivation, the Kakinada Experiment.

UNIT II: PROJECT IDENTIFICATION & CLASSIFICATION

Meaning of project, project identification, Project classification. Project formulation – need, concept, significance and elements of project formulation, project report. Ratio analysis. Licensing registration, security required, important provisions of Factory Act.

UNIT III: FINANCIAL INSTITUTIONS

NABARD, IDBI, IFCI, DIC – PIPDIC, SIS, SISI, SIDBI, SIPCOT, GIC Commercial banks, - their loan facilities. Choice of most suitable agency. Approaching an institution for assistance.

UNIT IV: ACCOUNTS AND BOOK KEEPING

Concepts, applications, advantages and disadvantages of single entry and double entry system. Concepts of Journal, ledger, subsidiary books, cash book, Trial balance – rectification of errors. Trading account/manufacturing account. Profit and loss account and balance sheet. Concepts of bills and receipts.

UNIT V: APPLICATION OF COMPUTER IN ENTREPRENEURSHIP DEVELOPMENT

I. MS – Windows

Introduction, Exploring the Desktop, Running multiple programmes, Accessories, Control Panel, Managing Document and Folders.

II. MS-WORD

Starting MS - WORD, Creating and Formatting a document, Changing Fonts and point size, Table Creation and Operations, Autocorrect, Auto Text, Spell Check, Thesaurus, Word Art, Inserting objects, Mail merge, letter, lable, envelope, Page set-up, Page preview, Printing a document.

Course Name: ENTREPRENEURSHIP DEVELOPMENT

Course Code : BND-502P

Min. Hrs - Practical : 20 hrs

1. Conduct of mini market survey (one day exercise) through Data Collection questionnaire, & personal visits.
2. Entrepreneurial motivation training through games, role-playing discussions & exercise.
3. Analysis of sample project report- discussion.
4. Break even analysis- Practice.
5. Case study of two food service units.

Course Name: MODERN MATHEMATICS AND STATISTICS

Course Code : BND-503T

Min. Hrs - Theory : 40 hrs

UNIT I Introduction to statistics

Orientation to qualitative and quantitative analysis Introduction to quantitative procedures Basic principles and concepts in statistics.

UNIT II Measurement and computation

Fundamentals of measurement quantity and quality Scales of measurement: Nominal, ordinal, interval and ratio Reliability, validity and standardization of measurement .

UNIT III Organisation and presentation of data

Data reduction strategies Coding and tabulation Grouping of data: Frequency distribution Graphic representation: Graphs, diagrams and charts Descriptive statistics and its applications Applications of descriptive statistics Characteristics of distributions: Skewness, Kurtosis Percentage, percentile ranking and frequencies

UNIT IV Probability and normal distribution

Basic principles and applications of probability Testing hypotheses: Levels of significance and estimation Errors in hypothesis testing: Type I, Type II Sampling, theory, method Z scores, calculation and application.

UNIT V Statistical tests

Parametric tests of difference: T test, ANOVA and post hoc analysis of significance Parametric tests of association: Pearson's product moment r Non-parametric tests of difference: Mann-Whitney, Sign, Median, and Kruskal –Wallis Non-parametric tests of association: Spearman's r Chi square test.

UNIT VI Regression and prediction

□ Regression equation □ Applications of regression

Course Name: MODERN MATHEMATICS AND STATISTICS

Course Code : BND-503P

Min. Hrs - Practical: 20 hrs

- Practice questions from the Theory topics.

Course Name: DIETETICS AND COUNSELLING

Course Code : BND-504T

Min. Hrs - Theory : 40 hrs

UNIT I :Practical consideration in giving dietary advice and counselling -

Factors affecting and individual food choice.

Communication of dietary advice

Consideration of behaviour modification, Motivation.

UNIT II Counselling and educating patient

Introduction to nutrition counselling

Determining the role of nutrition counsellor

Responsibilities of the nutrition counsellor

Practitioner v/s client managed care

Conceptualizing entrepreneur skills and behaviour

Communication and negotiation skills.

UNIT III Teaching aids used by dietitians-

Charts, leaflets, posters etc., preparation of teaching material for patients suffering from Digestive disorders, Hypertension, Diabetes, Atherosclerosis & Hepatitis and cirrhosis.

UNIT IV Computer application

Use of computers by dietitian, Dietary computations, Dietetic management, Education/training, Information storage, Administrations, Research, Straight line, frequency table, bar diagram, pie chart, Preparation of dietary charts for patients, Statistical computation- mean, median, standard deviation, conclusion and regression test.

Course Name: FOOD STANDARDS AND QUALITY CONTROL

Course Code : BND-505T

Min. Hrs - Theory : 40 hrs

UNIT I: FOOD QUALITY AND QUALITY CONTROL

Meaning, objectives, important considerations, principles of – quality control of food, raw material and inspection of finished products. Total Quality Management (TQM) - Parameters, evolution, elements TQM, need for TQM and of implementation of TQM in the food industries.

UNIT II: INDEX OF NUTRITIONAL QUALITY (INQ)

Need for INQ, INQ as an evaluating tool in the food industry, nutrition labeling of foods. Methods of assessing food quality - Cereals and Pulses, fruits and vegetables, milk, meat and its products, egg, Oils, fats, nuts and oilseeds.

UNIT III: STANDARD OF FOODS

Cereals and Pulses, fruits and fruits products, vegetable and vegetable products, coffee, tea, sugar and sugar products, milk and milk products, eggs and selected fleshy foods.

UNIT IV: MICROBIOLOGICAL QUALITY CONTROL OF FOODS

Fundamentals and Principles, factors influencing microbial association with foods, control of microflora at different stages of processing. Hazards Analysis and Critical Control Points (HACCP) - Meaning, Quality evaluation, steps involved in HACCP, Implementation and problems in HACCP

UNIT V: NUTRITIONAL CHANGES IN FOODS DURING PROCESSING

Nutritional losses, nutritional gains, changes in the physical, chemical properties and organoleptic qualities of foods due to processing.

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

Course Name: PRACTICAL FOOD SERVICE MANAGEMENT

Course Code : BND-601T+P

Min. Hrs – Theory+Practical: 20+80 hrs

1. Equipments – Classification of equipments, selection & purchase of equipments. Installation and operation, care & maintenance of equipments.
2. Menu Planning – Types of menu , writing menus , construction of menus, menu display.
3. Food Service – Different styles of service presentation & display of food.
4. Planning and organizing for a food service unit.
5. Running a Food Service unit in the college canteen.

Course Name: DIETETIC FOOD DEVELOPMENT

Course Code : BND-602T+P

Min. Hrs –Theory+ Practical : 20+80 hrs

1. Planning and preparation of diet in various diseases and disorders:
 - a) Normal diet
 - b) Clear fluid diet, full fluid diet and soft diet.
 - c) High calorie diet for underweight and low calorie diet for overweight.
 - d) For peptic ulcer, constipation and celiac sprue.
 - e) Anemia during pregnancy and anemia in a normal person.
 - f) Hypertension and atherosclerosis.
 - g) Nephritis, nephritic syndrome and nephrolithiasis.
 - h) Diabetes Mellitus
 - i) Gout
 - j) Cirrhosis and viral hepatitis
 - k) Cancer and AIDS.

Course Name: INTERNSHIP/ IN-PLANT TRAINING

Course Code : BND-603P

Time Duration: 03 months

1. There will be an internship of students for three months in the Dietetics department of a Hospital.
2. They shall maintain logbook of patients and their diets.
3. They will identify the most common nutrition- related disorders in the patients of the hospital.
4. At the end of the academic year, students will have to prepare a Report in accordance to their logbooks.
5. The students should present a powerpoint presentation on any one of the nutrition-related disorders.
6. Marks should be provided according to the following:

Performance in the hospital/Report Writing:	50 marks
Presentation:	100 marks
Viva-voce Examination:	100 marks

Total: 250 marks