EXAM SCHEME AND SYLLABUS

(Applicable for the batches admitted from the Academic Session 2023-24 onwards)

Bachelor of Human Nutrition

(BHN, 3 Year Degree Programme)

FACULTY OF PARAMEDICAL SCIENCE & ALLIED HEALTH SCIENCE

Chirayu University

Bhopal, MP 462030, India

AIMS: To have strong knowledge of food safety and sanitation. Looking over the nutritional requirements of common people. They are food counselors who help in preparing the diet plans of the clients.

OBJECTIVE:

The student must-

1.Recognize "Health for all" as a national goal & right of all citizens and by undergoing training, student will be able to fulfil his/ her social obligations towards realization of this goal.

2.Learn various aspects of National policies on health & devote him/her to its practical implementation.

3.Develop scientific approach, acquire educational experience for proficiency profession and promote healthy living

4.Student will be able to learn different aspects of nutrition applicable to daily living & how we can provide quality of life by preventing & curing disease.

5.He/she will be familiar with basic essential for implementation of National Health.

6.Programmes including practical aspects of family welfare, maternal & child health, health & nutrition education.

7.Able to identify community nutrition problems & learn to work to resolve these by designing & instituting corrective steps and evaluating outcome of such measures.

8.He/she will be able to identify clinical needs of patients & design diet regime for them.

Syllabus For B.Sc. in Human Nutrition (B.Sc.-HN)

Academic Programme Duration: 3 years

DURATION OF COURSE:

- B.Sc. in Human Nutrition is a full-time course.
- Duration: Three years.
- Divided into three professional examinations:
    - B.Sc. in Human Nutrition (B.Sc.-HN) Part-I at the end of the first academic year.
    - B.Sc.-HN Part-II at the end of the second academic year.
    - B.Sc.-HN Part-III at the end of the third academic year.

EXAMINATION:

- Annual university examination at the end of each academic year.
- Consists of theory papers and practical examinations.
- Candidates must appear in every subject specified in the course structure for each year.

Duration of Examination: Each theory paper shall be of three hours.

Scheme of Examination: B.Sc. in Human Nutrition Part-I (First Year) University Examination

S. No.	Subjects	THEORYMARKS				PRACTICALMARKS				Total marks
		Theory Paper	Internal Assessment	Total	Minimum marks	Practical	Internal Assessment	Total	Minimum Marks	
1	Basic Nutrition	80	20	100	50	80	20	100	50	200
2	Human Physiology	80	20	100	50	80	20	100	50	200
3	Nutritional Biochemistry	80	20	100	50	80	20	100	50	200
4	Family meal management	80	20	100	50	80	20	100	50	200
5.	On the job training							100	50	100

B.Sc. in Human Nutrition Part-II (Second Year) University Examination

S. No.	Subjects	THEORYMARKS				PRACTICALMARKS				Total marks
		Theory Paper	Internal Assessment	Total	Minimum marks	Practical	Internal Assessment	Total	Minimum Marks	
1	Basic Dietetics	80	20	100	50	80	20	100	50	200
2	Food Microbiology	80	20	100	50	80	20	100	50	200
3	Food Science	80	20	100	50	80	20	100	50	200
4	Personnel management	80	20	100	50	80	20	100	50	200
5.	On the job training							100	50	100
	Grand Total									900

B.Sc. in Human Nutrition Part-III (Third Year) University Examination

S. No.	Subjects	THEORYMARKS				PRACTICALMARKS				Total marks
		Theory Paper	Internal Assessment	Total	Minimum marks	Practical	Internal Assessment	Total	Minimum Marks	
1	Community Nutrition	80	20	100	50	80	20	100	50	200
2	Advanced Dietetics	80	20	100	50	80	20	100	50	200
3	Dietetics & Counseling	80	20	100	50	80	20	100	50	200
4.	Project Work							300		300
	Grand Total									900

INTERNAL ASSESSMENT:

- For theory and practical.
- Conducted throughout the year.
- Candidate must obtain at least 35% marks in theory and practicals separately in internal assessment to be eligible for the annual university examination.
- Internal assessment (Theory):
    - Mid-term and term examinations = 10 marks.
    - Assignments/Projects/Class test/Clinical Presentations = 05 marks.
    - Attendance = 05 marks.
    - Total = 20 marks.
- Internal assessment (Practical):
    - Laboratory manual = 10 marks.
    - Day-to-day performance and attendance = 10 marks.
    - Total = 20 marks.

CRITERIA FOR PASSING:

- Computation of 50% marks in theory: Add the marks scored in internal assessment (theory) to the University-conducted written examination marks.
- Computation of 50% marks in practical: Add the marks scored in internal assessment (practical) to the University-conducted practical examination marks.

GRACE MARKS:

- Candidate failing in the practical examination will be considered as failed.

SUPPLEMENTARY EXAMINATION:

- A candidate failing in a subject but securing at least 30% aggregate marks will be required to appear in the university examination after 3 months in that subject.

DIVISION AND DEGREE:

- Candidate will be awarded a division at the end of the 3rd academic year as follows:
    - First Division: 60% and above.
    - Second Division: 50% and above.
    - Third Division: 40% and above.

COURSE OF STUDY

FIRST YEAR:

S. No.	Subjects	Units	Teaching Hours per Week
1	Basic Nutrition	2	6 hours
2	Human Physiology	3	6 hours
3	Nutritional Biochemistry	2	6 hours
4	Family Meal Management	1	6 hours

SECOND YEAR:

S. No.	Subjects	Units	Teaching Hours per Week
1	Basic Dietetics	3	6 hours
2	Food Microbiology	2	6 hours
3	Food Science	2	6 hours
4	Personnel Management	1	6 hours

THIRD YEAR:

S. No.	Subjects	Units	Teaching Hours per Week
1	Community Nutrition	3	6 hours
2	Advanced Dietetics	3	6 hours
3	Dietetics & Counseling	2	6 hours

B.Sc. in Human Nutrition (B.SC.-HN) First Year
BASIC NUTRITION
Min. Hrs. - Theory: 100 hrs. & Practical: 80 hrs.
THEORY

1. Introduction to nutrition - Food as source of nutrients, functions of food, definition of nutrition, nutrients & energy, adequate, optimum & good nutrition, malnutrition.
2. Nutrition - Fitness, Athletics & Sports.
3. Food guide - Basic five food groups How to use food guide (according to R.D.A.)
4. Interrelationship between nutrition & health: - Visible symptoms of good health
5. Use of food in the body - Digestion, Absorption, transport & utilization.
6. Role of fibers in human nutrition.
7. Carbohydrates: Functions, classification, food sources, storage in the body.
8. Fats & oils: composition, saturated and unsaturated fatty acids, classification, food sources, function of fats.
9. Proteins - composition, sources, essential & non-essential amino acids, functions, Protein deficiency.
10. Water - as a nutrient, function, sources, requirement, water balance & effect of deficiency.
11. Minerals - macro & micronutrients. - functions, sources. Bioavailability and deficiency of Calcium, Iron, Iodine, Sodium & Potassium (in very brief)
12. Vitamins (water & fat-soluble) - definition, classification & functions.

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 in a standard recipe - a) portion size - b) Beverages - tea, coffee, cocoa, fruit juice, milk, milkshakes.
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 omelet & eggnogs.
7. Soups - Basic, clear and cream soups.
8. Snacks - Pakoras, cheese toast, upma, pohe, peanut chikki, til & laddo

Book references:

1. B. srilakshmi: Dietetics, New Age International Publishers.
2. Guthrie, A.H.: introductory Nutrition, 6th Ed. The C.V. Mesby Company.
3. Robinson, C.H. Lawler, M.R.; CheiToweth, W.L. and Garwick, A.E.: Normal and Therapeutic Nutrition. 17th Ed. Mac Millan Publishing Co.
4. Swaminathan, M: Essentials of Foods and Nutrition, Vols-1 and II. Ganesh and Co. Madras.
5. Gopalan, C. etal: Nutritive value of Indian Foods, Indian Council of Medical Research.

HUMAN PHYSIOLOGY

Min. Hrs - Theory: 100 hrs& Practical: 80 hrs.

THEORY

1.Cell-Structure and function

2.Blood-Blood cells, Hemoglobin, Blood groups, Coagulation Factors, Anaemia

3.Skeletal System- Bones, joints & bone deformities in brief.

4.Cardio vascular system

Heart rate, Cardiac cycle, cardiac output, blood pressure, hypertension, radial pulse.

5.Lymphatic system -Lymph glands and its function, spleen-structure and functions.

6.Respiratory System-Ventilation, Functions, Lungs volumes and capacities.

7.Gastrointestinal System-Process of digestion in various parts.

8.Endocrinology

List of Endocrine glands, Hormones: Their secretion and functions (in brief).

9.Excretion system-Structure of nephron, Urine formation

10. Central Nervous System

Parts, Sliding Filament Theory, Neuro Muscular Junction, Wallerian Degeneration, Motor Nervous system-Upper motor neuron system & lower motor neuron system. Sensory nervous system, Sympathetic Nervous system & Parasympathetic nervous system.

11. Skin-Structure and functions

12. Reproductive system

Structure and functions of male & female reproductive organs, menstruation, puberty, menopause, fertilization and development of fertilized ovum, placenta and its function.

13. Special senses

Structure and function of eye and ear, common diseases of eye and ear (in brief)

PRACTICAL

1.Microscope and its use.
2.Microscopic appearance of prepared slide.
3.Identification of blood cells by study of peripheral blood smear.
4.Measurement of pulse and blood pressure.
5.Elicitation of Reflexes and jerks.
6.Estimation of haemoglobin, RBC,WBC,TLC,DLC and ESR.

Book References:

1. Guyton. A.C. Hall, J.E.: Text Gbook of Medical Physiology- 9th Ed/ Prism Books (Pvt.) Ltd. Bangalore.
2. Winword. Sear's Anatomy and Physiology for nurses. London, Edward Arnell.
3. Wilson: Anatomy and Physiology in Health and Illness, Edinburgh Churchill Livingatome.
4. Chatterjee Chandi Charan: Text Book of Medical Physiology, London W.B.
5. Ganong: Medical Physiology

NUTRITIONAL BIOCHEMISTRY
Min. Hrs - Theory: 100 hrs& Practical: 80 hrs.

THEORY

1. **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).
2. **Chemistry of carbohydrates & their related metabolism** - Introduction, definition, classification, 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.
3. **Amino acids** - Definition, classification, essential & non-essential amino acids.
4. **Chemistry of Proteins & their related metabolism** - Introduction, definition, classification, biomedical importance Metabolism: Transformation, Decarboxylation, Ammonia formation & transport, Urea cycle.
5. **Chemistry of Lipids & their related metabolism Introduction**, definition, classification, 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.
6. **Enzymes** -Introduction, definition, classification, 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.
7. **Acid base balance concepts & disorders** - pH, Buffers, Acidosis,Alkalosis
8. **Hormones** -Classification, general mode of action, hormones of Pituitary, Thyroid, Parathyroid, Adrenals, Reproductive Glands, Pancreas, hormonal disorders, counter regulatory hormones.
9. **Vitamins** -Water & fat soluble vitamins, sources, requirement, deficiency disorders & biochemical functions.
10. **Water metabolism**- Distribution of fluids in the body, ECF, ICF, Water metabolism, dehydration.
11. **Hyperglycemia & hypoglycemia**–Diabetes mellitus - definition, types, features, gestation diabetes mellitus, glucose tolerance test, glycosuria, Hypoglycemia & its causes
12. **Liver functions and their assessment –**
    Based on -

a) Carbohydrate metabolism
b) Protein metabolism
c) Lipid Metabolism
d) Measurements of serum enzyme levels
e) Bile pigment metabolism: Jaundice - its types and their biochemical findings.

13. **Renal functions tests –**
    Various tests, GFR & clearance.
14. **Tumor markers & their clinical applications** -Including oncofeatal antigens, CEA etc.
15. General concepts & functions of immunoglobulins

PRACTICAL

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

Book references:

1. Text Book of Biochemistry. West, E.S., Todd, W.R.; Mason. H.S. and Van Bruggen J.T.
2. Harper's Biochemistry. Lange Medical Book. Murray, r. K. Grannen, D.K.; Mayes, P.A. and Rodwell. V.W.
3. Principles of Biochemistry, Me. Grew Hill Book Co.
4. Principles of Biochemistry. Lehninger, A.L.; Nelson, D.L. and Cox, M.M.
5. Textbook of Biochemistry with Clinical Co- relations. Devlin, T.M.

FAMILY MEAL MANAGEMENT
Min. Hrs – Theory: 100 hrs & Practical: 80 hrs.

THEORY

1. Introduction to meal management- balanced diet, food groups & the planning of balance diet.
2. Food guides for selecting adequate diet.
3. Diet therapy
4. Diet & stress in current scenario.
5. Meal planning for the family.
6. Indian meal patterns- vegetarian & non-vegetarian.
7. Food faddism & the faulty food habits.
8. Nutritive value of common Indian recipes.
9. Nutrition in pregnancy- Physiological stages of pregnancy, nutritional requirements. Food selection, complication of pregnancy.
10. Nutrition during lactation- Physiology of lactation, nutritional requirements.
11. Nutrition during infancy- Growth & development, nutritional requirements, breast feeding, infant formula, introduction of supplementary foods.
12. Nutrition during early childhood (Toddler/Preschool) - Growth & nutrient need, nutrition related problems, feeding patterns.
13. Nutrition of school children – Nutritional requirement, importance of snacks, school lunch.
14. Nutrition during adolescence- Growth & nutrient needs, food choices, eating habits, factor influencing needs.
15. Nutrition during adulthood- Nutritional requirements, feeding pattern.
16. Geriatric nutrition: Factors affecting food intake and nutrient use, nutrient needs, nutrition related problems.

PRACTICAL

Planning, preparation and nutritional evaluation of diets in relation to activity levels and physiological state.

1. Planning and preparation of a Balanced diet for a pregnant woman.
2. Diet during complication of pregnancy.
3. Planning and preparation of a balanced diet for a lactating woman.
4. Preparation of weaning foods.
5. Planning and preparation of a balanced diet for pre-school child.
6. Balanced diet for school going child Preparation of packed lunch.
7. Planning and preparation of a balanced diet for adolescence.
8. Planning of meals for adult belonging to different in come group.
9. Planning meal for senior citizen.
10. Project work with proper diet plan based on survey.

ON THE JOB TRAINING
Min. Hrs - 160 hrs.

1. The Students of first year shall do the survey of patients suffering from various diseases and shall plan appropriate diet for them.
2. They shall maintain log book of patients and their diets.
3. At the end of academic year their log books will be evaluated by the faculty concerned.

Book References:

1.Indian Council of Medical Research: Nutrient Requirements and Recommended – Dietary Allowance for Indians, New Delhi.

2.FAO/ WHO/ UNO: Technical Reports Series, 724 (1985). Energy and Protein Requirement, Geneva.

3.The Feeding and Care of Infants arid Young Children, VHAI. Ghosh, S

4.WHO: A growth chart for International use in Maternal and Children Health Care, Geneva.

5.Mann and Truswell: Essentials of Human Nutrition, Oxford University Press.

WHO Technical Reports Series for Different Nutrients.

B.Sc. in Human Nutrition (B.SC.-HN) Second Year
BASIC DIETETICS
Min. Hrs - Theory: 100 hrs& Practical: 100 hrs.
THEORY

1. Role of dietarian: The hospital & community.
2. Basic concepts of diet therapy.
3. Principles of diet therapy & therapeutic nutrition for changing needs.
4. Adaptation of normal diet for changing needs.
5. Routine hospital diets- Regular diet, light diet, full liquid and tube feeding.
6. Modification of diet- Febrile conditions, infections and surgical conditions.
7. Diets for gastro-intestinal disorders, constipation, diarrhoea, peptic ulcer.
8. Diet for renal diseases- Nephritis, Nephrotic syndrome and renal failure.
9. Diet for obesity and cardiovascular disorders.
10. Diet for Diabetes mellitus.
11. Diet & nutrition in kidney diseases.
12. Nutrition in cancer.
13. Nutrition in Immune system dysfunction, AIDS & Allergy.
14. Nutrition support in metabolic disorders.
15. Nutrition in burns and surgery.
16. Nutrition-Addictive behavior in anorexia nervosa, bulimia & alcoholism.
17. Nutrient drug interaction.
18. Feeding the patients- Psychology of feeding the patient, assessment of patient needs.
19. Feeding infants & children-problems in feeding children in hospitals.
20. Nutrition & diet clinics- Patients checkup and dietary counseling, educating the patient and follow up .

PRACTICAL

1. Standardization of common food preparations.
2. Planning, preparation and calculation of following diets:
   a) Normal diet.
   b) Liquid diet
   c) Soft diet
   d) High and low caloric diet
   e) Bland diet for peptic ulcer
   f) Diet for Viral hepatitis and cirrhosis
   g) Diet for Diabetes mellitus
   h) Diet for Hypertension and Atherosclerosis
   i) Diet for Nephritis and Nephrotic syndrome
   j) Low and medium cost diets for P.E.M., Anemia & vitamin A deficiency.

Book References:

1. Nutrition and Health and Disease. Anderson, L., Dibble, M.V., tukki, P.R., Mitchell, H.S., and Rynbergin H.J.
2. Clinical dietetics and Nutrition. Anita F.P.
3. Kranse's Food, Nutrition and Diet. Mahan, L.K., Arlin, M.T.
4. Normal and Therapeutic Nutrition. Robinson. C.H. Lawaler, M.R. Chenoweth.
5. Nutrition and Diet Therapy, Williams S.R.

FOOD MICROBIOLOGY

Min. Hrs – Theory: 80 hrs& Practical: 80 hrs.

THEORY

1. Introduction of microbiology and its relevance to everyday life. General characteristics of bacteria, fungi, virus, protozoa, and algae .
2. Growth of microorganisms: Growth curve, effect of environmental factors in growth of microorganism - pH , water activity , oxygen availability, temperature and others.
3. Microbiology of deficient food: Spoilage, contamination sources, types, effect on the following:
   a. Cereal and cereal products
   b. Sugar and sugar products.
   c. Vegetables and fruits
   d. Meat and meat products.
   e. Fish, egg and poultry, Milk and milk products
   f. Canned foods.
4. Environmental microbiology:
   a. Water and water borne diseases.
   b. Air and air borne diseases.
   c. Soil and soil borne diseases.
   d. Sewage and diseases.
5. Beneficial effect of microorganisms.
6. Relevance of microbial standards for food safety.
7. Waste product handling:-
   a. Planning for waste disposal.
   b. Solid wastes and liquid wastes.
8. Microbial intoxication and infections: Sources of contamination of food, toxin production and physiological action, sources of infection of food by pathogenic organisms, symptoms and method of control.
9. Relevance of microbiology standards for food safety.

PRACTICAL

1. Study of equipments 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.

Book References:

1. Food Microbiology, MaGraw Hill Inc. Prazier, W.C. and Westhoff, D.C. (1988).
2. Modern Food Microbiology. Jay James.N.
3. Microbiology, McGraw Hill Company, New York. Peleezar, M.I. and Reid, K.D.
4. Microbiological Application. Benson Harold. J.
5. Microbiological Methods Butterworth. London.

FOOD SCIENCE

Min. Hrs - Theory : 80 hrs & Practical : 80 hrs.

THEORY

1. Cereal- Structure and composition, Nutritional value, Processing- Milling, polishing. parboiling, flaking, parching, roasting, use in variety of preparations selection, storage and care, breakfast cereals.
2. Pulses: Composition and nutritional value, processing, soaking, germination.
3. Cooking and fermentations: Toxic constituents of pulses, Lathyrism.
4. Nuts and oil seeds: Nutritive value, importance & classification.
5. Milk and milk products: Composition of milk, properties and effect of heat, n nutritional importance, milk processing, milk products.
6. Flesh foods- Selection, storage, uses and nutritional aspects of meat, fish and poultry, spoilage of fish.
7. Fruits and vegetables: Classifications, composition and importance in human nutrition storage, cooking of vegetables, changes during cooking, effect of heat, acid and alkali.
8. Sugar and Sugar products
   (a) Form of sugar and liquid sweetness.
   (b) Caramelization, Hydrolysis, Crystallization
   (c) Indian confectionery
9. Beverages: Coffee, tea, and cocoa, processing composition and preparation, spices and condiments, types and composition.
10. Fats and oils: Types, role of fat in cookery.
11. Egg- composition & classification of egg & egg products, its nutritive value.
12. Baking-Types of bake products & its nutritive value.
13. Role of spices in food science- Importance, composition & classification.

PRATICAL

1. Detection of toxins and adulterants of some of the common foods.
2. Preparation of some confectionary products.
3. Preparations of some traditional, fermented and other products.
4. Preparation of soya bean products and their accept ability test.
5. Survey of marketed processed and labeling of processed food items.
6. Nutritional value & criteria of food selection in Indian diet according to ICMR.
7. Visit to confectionaries.

Book References:

1. Food Commodities Ltd. London.
2. Introductory Foods, Macrnillan & Co., New York.
3. Catering survey and Technology, John Murrey Pube,' London.
4. Food sciences: B. Shrilakshami.
5. Food sciences: Manne Sakuntala.

PERSONNEL MANAGEMENT
Min. Hrs - Theory : 100 hrs& Practical : 80 hrs.

THEORY

1. Organization and management:
   a) Definition and types of organization.
   b) Definition-functions and tools of management.
   c) Technique of effective management and its application to food preparation and science.
2. Food material management:
   a) Meaning, definition, and importance.
   b) Food selection, purchasing, receiving and store room management.
   c) Control in relation to the above operations (material planning, budgeting, material identification, modification and standardization, inventory control, store keeping, definition, objectives, functions, factors underlying successful store keeping, duties and responsibilities of a storekeeper, purchasing, organization, principle, procedure, systems and quality control).
3. Personnel Management: Recruitment, selection and training of personalities, work standards, productivity, supervision, performance appraisal and motivation incentives for effective performances.
4. Labour policies and legislation: (Personnel policies related to salaries, other emoluments, allowances, leave, uniform and other prize benefit, laws and organization)- Laws affecting food service institution to study the following: (hospital, flight kitchen, hotel, restaurant, canteen, Industrial) -
   a. Organization
   b. Physical plan and layout.
   c. Food and silver equipment
   d. Sanitation and hygiene.

PRACTICAL

Visit and appraisal of any two medical organization.

1. Works implification: food preparation, Calculating work unit, time norms etc.
2. Costing, accounting, budgeting, purchase.
3. Storekeeping: Listing and management of food items in the store.
4. Personnel recruitment: Preparations of a project and report making.
5. Maintenance of the clothing for persons and staff involved in kitchen area.
6. Prepare an inventory for evaluating staffs personal hygiene.

ON THE JOB TRAINING
Min. Hrs - 160 hrs.

1. The students of first year shall do the survey of patients suffering from various diseases and shall plan appropriate diet for them.
2. They shall maintain logbook of patients and their diets.
3. At the end of academic year their logbooks will be evaluated by the faculty concerned.

Book References:

1. Modern Nutrition in Health and Managemen – Schill's.
2. Essence of nutrition by Salins Onila.

B.Sc. in Human Nutrition (B.SC.-HN) Third Year
COMMUNITY NUTRITION
Min. Hrs - Theory : 100 hrs& Practical : 100 hrs.
THEORY

1. Nutrition and health in National development.
2. Malnutrition -meaning. Factors contributing to malnutrition, overnutrition.
3. Nutritional disorders- Epidemiology, clinical features, prevention and dietary treatment for Protein Energy malnutrition, nutritional anaemias & vitamin deficiency disorders .
4. 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.
5. Improvement of nutrition of a community:
   a) Modern methods of improvement or nutritional quality of food, food fortification, enrichment and nutrient supplementations.
   b) Nutrition education themes and messages in nutrition and health, Antenatal and postnatal care.
6. 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.
7. National and International agencies in uplifting the nutritional status -WHO,UNICEF, CARE, ICMR, ICAR, CSIR, CFTRI. Various nutrition related welfare programmes, ICDS, SLP, MOM, and others (in brief).
8. Community nutrition programme planning - Identification of problem, analysis of causes, resources constraints, selection of interventions, setting a strategy, implementations and evaluation of the programme.

PRACTICAL

1. Diet and nutrition surveys:
   (a) Identification of vulnerable and risk groups.
   (b) Diet survey for breast- feeding and weaning practices of specific groups.
   (c) Use of anthropometric measurement in children.
2. Preparation of visual aids.
3. Field visit to
   (a) Observe the working of nutrition and health oriented programmes (survey based result).
   (b) Hospitals to observe nutritional deficiencies.

Book References:

1. Assessment of the Nutritional status of the Community; World Health Organisation. Jeilliffe,, D.B.
2. Methods of the Evaluation of the Impact of Food and Nutrition Programmes. Sain, D.R. Lockwood, R., Schrimshaw, N.S.
3. Learning Bettor Nutrition FAO, Rome.
4. Nutrition Monitoring a Assessment : Oxford University Press.
5. Nutritional surveillance, W.H.O. : Mason J.B.

ADVANCED DIETETICS

Min. Hrs - Theory : 100 hrs& Practical : 100 hrs.

THEORY

1. Concept of Diet therapy: growth and source of dietetics, purpose and principles of therapeutic diets, modification of normal diet, classification of therapeutic diets.
2. Role of Dietician: Definition of nutritional care, interpersonal relationship with patient, planning and implementary dietary care, Team approach to nutritional care.
3. Routine hospital diets: Preoperative and postoperative diets, study and review of hospital diet. Basic concepts and methods of -
   (a) Oral feeding
   (b) Tube feeding
   (c) Parental nutrition
   (d) Intravenous feeding.
4. Diet in surgical conditions, burns and cancer.
5. Obesity and leanness- causes, complication and health effects, dietary treatment and other recommendation.
6. Diet in fever and infections-Types-metabolism in fever, general dietary consideration diet in influenza, typhoid fever, recurrent malaria and Tuberculosis .
7. Diet in gastritits, peptic ulcer- symptoms, clinical findings, treatment, dietary modification, adequate nutrition, amount of food, and intervals of feeding, Chemically and mechanically irrigating foods, four stage diet (Liquid, soft, convalescent, liberalized diet).
8. Diet in disturbances of small intestine and color.
   - Diarrhoea- (child and adult)- classification, modification of diet ,fibre, residue. fluids & nutritional adequacy.
   - Constipation-flatulence-dietary considerations.
   - Ulcerative colitis(adults)-symptoms, dietary treatment.
   - Spruce, coeliac disease-disaccharide in tolerance, dietary treatment.
9. Diet in diseases of the liver, gall bladder and pancreas,
   a) Etiology, symptoms and dietary treatment in-Jaundice, hepatitis, cirrhosis and hepatic coma.
   b) Role of alcohol in liver diseases.
   c) Dietary treatment in cholecystitis, cholelithiasis and pancreatitis.
10. Gout- Nature and occurrence of uric acid, causes, symptoms and diet.
11. Diet in allergy and skin disturbances: Definition, classification, manifestations, common food allergies and test and dieteric treatment.
12. Diet in Diabetes mellitus:
    a) Incidence and predisposing factors.
    b) Symptoms-types and tests for detection.
    c) Metabolism in diabetes
    d) Dietary treatment & meal management
    e) Hypoglycemic agent, insulin and its types.
    f) Complication of diabetes.
13. Diet in Renal diseases: Basic renal function, symptoms and dietary treatment in acute and chronic glomerulonephritis, Nephrosis, renal failure, dialysis. urinary calculi-causes & treatment, acid and alkali producing and neutral foods and dietary treatment.
14. Diet in Cardiovascular diseases: Role of nutrition in cardiac efficiency, incidence of Atherosclerosis, dietary principles, Hyperlipidemia, Hypertension- causes and dietary treatment, Sodium restricted diet, level of sodium restriction, sources of sodium, danger of severe sodium restriction.

PRACTICAL

1. Planning, preparations and calculations of diets with modified-
   (a) Consistency
   (b) Fibre and residue
   (c) Diet for Diarrhoea and constipation
   (d) Diet for peptic ulcer.
   (e) Diet for liver disease.
2. Planning, preparation and calculation of diets in fever and infections.
3. Planning, preparation and calculation of diets for insulin dependent Diabetes mellitus, Planning, snacks. deserts and beverages for diabetes.
4. Planning. preparation and calculation of diet in cardio vascular diseases.
5. Planning, preparations and calculation of diet in Kidney failure , Kidney transplant, Renal complication & Kidney stones.
6. Planning, preparations and calculation of diet in Cancer, Trauma (burns) & Surgery.

Book References:

1. A Textbook of Food, nutrition and Dietetics. Raheena, Begum.
2. Nutrition And Dietetics. Joshi, S.A.
3. Nutrition and Diet Therapy. Williams S.R.
4. Normal and Therapeutic Nutrition.
5. Clinical Dietetics and Nutrition. Anita F.P.

DIETETICS AND COUNSELLING
Subject Code : BHN-303
Min. Hrs - Theory : 100 hrs& Practical : 100 hrs.

THEORY

1. Practical consideration in giving dietary advice and counselling-
   a) Factors affecting and individual food choice.
   b) Communication of dietary advice
   c) Consideration of behaviour modification
   d) Motivation.
2. Counselling and educating patient
   a) Introduction to nutrition counselling
   b) Determining the role of nutrition counseller
   c) Responsibilities of the nutrition counseller
   d) Practitionerv/s client managed care
   e) Conceptualizing entrepreneur skills and behaviour
   f) Communication and negotiation skills.
3. 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.
4. Computer application
   a) Use of computers by dietitian
   b) Dietary computations
   c) Dietetic management
   d) Education/training
   e) Information storage
   f) Administrations
   g) Research
5. Computer application
   a) Execution of software packages
   b) Straight line, frequency table, bar diagram, pie chart, Preparation of dietary charts for patients
   c) Statistical computation- mean, median, standard deviation, conclusion and regression test.

PRACTICAL

1. Project planning for anyone disease.
2. Computer application for different diseases.
3. Submitting computed data.
4. Preparations of teaching aids in the field of nutrition.
5. Preparation of case history of a patient and feeding of information in the hard disc.

Books References:

1. Clinical Dietetics and Nutrition. Anita F.P.
2. Nutrition and Diet Therapy. Williams S.R.
3. Nutrition And Dietetics. Joshi, S.A.

PROJECT WORK
Min. Hrs.-160 Hrs

1. Basic concepts of project planning
   a) Defining objectives- Need, problem, project, feasibility, planning, formulation.- Identifying resources
   b) Methods/approaches, Project Appraisal- Project Format
2. Guideline for project writing
   - Title of the project
   - Name of the person
   - Duration of the project, type of project.
   - Aims and objectives- summary of the proposed project
   - Project information, location, people and personnel involved.
   - Working/methodology
   - Evaluation
   - Writing and reporting