

# UNIVERSITY OF CALCUTTA

## SYLLABUS

F  
O  
R

### THREE-YEAR HONOURS DEGREE COURSE OF STUDIES



### FOOD & NUTRITION 2010

# UNIVERSITY OF CALCUTTA

## Syllabus for Three-Year B.Sc. (Honours) Course in Food & Nutrition

### DISTRIBUTION OF MARKS

#### **Food & Nutrition Honours (1+1+1 system) Full Marks-800**

Theoretical Paper – 500 Marks

Practical Paper – 300 Marks

#### **Part 1 Examination (1 year course) Full Marks-200**

Title of Papers

Paper-I : Unit-I	Module-1 : Human Nutrition (A)	25
	Module-2 : Human Nutrition (B)	25
Unit-II	Module-3 : Food Science (A)	25
	Module-4 : Food Science (B)	25
Paper-II : Unit-I	Module-5 : Physiology (A)	25
	Module-6 : Physiology (B)	25
Unit-II	Module-7 : Physiology (Practical)	25
	Module-8 : Fundamentals of Food preparation (Practical)	25

#### **Part II : (1 year course) Full marks 200**

Paper-III : Unit-I	Module-9 : Community Nutrition	50
Unit-II	Module-10 : Public health	25
	Module-11 : Epidemiology	25
Paper-IV : Unit-I	Module 12 : Food Commodities (A)	25
	Module 13 : Food Commodities (B)	25
Unit-II	Module 14 : Community Nutrition (Practical)	25
	Module 15 : Project Formulation	25



**Detailed Syllabus**  
**Part-I Examination (1 year course) - 200 Marks**  
**Paper-I (F.M. 100)**

**UNIT-I**

**MODULE-1**

Marks-25

HUMAN NUTRITION (A)

1. Concept and definition of terms-Nutrition, Malnutrition and Health:  
Scope of Nutrition.
2. Minimum Nutritional Requirement and RDA -  
-Formulation of RDA and Dietary Guidelines Reference Man and Reference Woman.  
Adult consumption unit.
3. Energy in Human Nutrition : Idea of Energy and its unit, Energy Balance, Assessment of Energy Requirements—deficiency and excess, Determination of Energy in food, B.M.R. and its regulation, -S.D.A. -
4. Growth & development from infancy to adulthood:  
Somatic, physical, brain and mental development, puberty, menarch, prepubertal and pubertal changes, Factors affecting growth and development. Importance of Nutrition for ensuring .adequate development.
5. Growth monitoring and promotion:  
Use of growth charts and standards, Preventions of growth faltering.

**MODULE-2**

Marks-25

HUMAN NUTRITION (B)

1. **Nutrition During Pregnancy**  
Factors (non-nutritional) affecting pregnancy  
outcome, importance of adequate weight gain during pregnancy, antenatal care and its schedule, Nutritional requirements during pregnancy and modification of existing diet and supplementation, Deficiency of nutrients, specially energy, iron folicacid, protein, calcium, iodine. Common problems of pregnancy and their managements, specially - nausea, vomiting, pica, food aversions, pregnancy induced hypertension, obesity, diabetes. Adolescent pregnancy.

2. **Nutrition during Lactation:**

Nutritional requirements during lactation, dietary management, food supplements, galactogogues, preparation for lactation. Care and preparation of nipples during breast feeding.

3. **Nutrition during Infancy:**

Infant physiology relevant to feeding and care, Breast feeding-colostrum, its composition and importance in feeding, Initiations of breast feeding. Advantages of exclusive breast feeding. Basic principles of breast feeding.

Introduction of supplementary foods, initiation and management of weaning, Baby-led weaning.

Bottle feeding-circumstances under which bottle feeding is to be given. Care & sterilization of bottles. Preparation of formula. Mixed feeding, breast feeding and artificial feeding.

4. Management of preterm and low birth weight babies.

5. Nutritional needs of toddlers, preschool, school going children- and adolescents - Dietary management.

**Reference:**

1. B. Srilakshmi: Dietetics, New Age International Publishers.
2. Guthrie, A. H.: Introductory Nutrition, 6th Ed. The C. V. Mosby 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.
3. Swaminathan, M. : Essentials of Foods and Nutrition, Vols -1 and II. Ganesh and Co. Madras.
4. Gopalan, C. etal : Nutritive value of Indian Foods, Indian Council of Medical Research.
5. Indian Council of Medical Research : Nutrient Requirements and Recommended-Dietary Allowance for Indians, New Delhi.
6. FAO/WHO/UNO : Technical Report Series, 724 (1985). Energy and Protein Requirement, Geneva.
7. WHO Technical Reports Series for different Nutrients.
8. Ghosh, S. : The Feeding and Care of Infants and Young Children, VHA. 6th Ed. Delhi.
9. WHO : A growth chart for International use In Maternal and Children Health Care, Geneva.
10. Mann and Truswell : Essentials of Human Nutrition, Oxford University press.

11. King, M. H.; King, P.M.A.; Morley, D; Burgess, A.P. : Nutrition for Developing Countries, ELBS Oxford University Press.
12. Indian National Code for Protection of Breast Feeding; Govt. of India. Ministry of Social Welfare, New Delhi. 1983.
13. S. Davidson and R. Passmore et al. Current Edition. Human Nutrition and Dietetics.

## **UNIT-II**

### **MODULE-3**

Marks-25

#### **FOOD SCIENCE (A)**

1. Basic concept on Food. Nutrients. Nutrition.
2. Classification of Food. Classification of Nutrients.
3. Carbohydrates - Definition, Classification. Structure and properties.

Monosaccharides - glucose, fructose, galactose.

Disaccharides - Maltose, lactose, sucrose

Polysaccharides - Dextrin, starch, glycogen, resistance starch.

4. Lipids - Definition, Classification & Properties.  
Fattyacids - composition, properties, types.
5. Proteins - Definition, Classification, Structure & properties.  
Amino acids - Classification, types, functions.
6. Carbohydrates - Sources, daily requirements, functions. Effects of too high - too low carbohydrates on health. Digestion & Absorption. Blood glucose and effect of different carbohydrates on blood glucose. Glycemic Index. Functional role of Sugars in food, Fermentation of Sugar.
7. Proteins - Sources, daily requirements, functions. Effect of too high - too low proteins on health. Digestion & absorption. Assessment of Protein quality (BV, PER, NPU). Factors affecting protein bio-availability including anti-nutritional factors.
8. Lipids - Sources, daily requirements, functions. Digestion & Absorption. Role & nutritional significances of PUFA, MUFA, SFA, W-3 fatty acid.

### **MODULE-4**

Marks-25

#### **FOOD SCIENCE (B)**

1. Dietary Fibre - Classification, sources, composition, properties & nutritional significance.
2. Minerals & Trace Elements, Bio-Chemical and Physiological Role, bio-availability & requirements, sources, deficiency & excess

(Calcium, Sodium, Potassium Phosphorus, Iron, Fluoride, Zinc, Selenium, Iodine, Chromium)

3. Vitamins - Bio-Chemical and Physiological Role Physiological role, bio-availability and requirements, sources, deficiency & excess.
4. Water - Functions, daily requirements, Water balance.
5. Elementary idea of Probiotics, Prebiotics, Organic Food.

**Reference :**

1. B. Srilakshmi : Nutrition Science, New Age International Publishers.
2. Sunetra Roday : Food Science & Nutrition, Oxford University Press.
3. Mann and Truswell: Essentials of Human Nutrition, Oxford University Press.

**PAPER-II (F.M. 100)**

**UNIT-I  
MODULE-5**

**PHYSIOLOGY (A)**

**Marks-25**

1. Structure & Functions of cells.
2. Blood and its composition, Blood groups, Coagulation of Blood, structure & function of Heart, Heart rate, Cardiac cycle. Cardiac out put. Blood pressure & their regulations. Circulation of blood (general course of circulation).
3. Gastrointestinal System :  
Structure and function of various organs of the GI tract, Digestion and absorption of food. The role of enzymes and hormones on digestion and absorption.
4. Reproductive System :  
Structure and function of Male and Female Sex glands and organs. Roll of hormones in reproduction.  
Menstrual Cycle Spermatogenesis.  
Physiology of pregnancy, Parturition, Lactation and Menopause.
5. Excretory System:  
Structure and functions of kidney, bladder, formation of urine, role of kidney in homeostasis.  
Structure and-function of Skin.  
Regulation of temperature of the body.
6. Respiratory System : Structure of respiratory system.

Mechanism of respiration and its regulations.  
O<sub>2</sub> and CO<sub>2</sub> transport in blood.  
Acclimatization. Anoxia.

## **MODULE-6**

### **PHYSIOLOGY (B)**

**Marks-25**

1. Nervous System  
Elementary anatomy of Nervous System  
Sympathetic and Parasympathetic nervous System.  
Special Senses.
2. Musculoskeletal System :  
Types of Muscles, functions and structure, formation of bone  
(General Idea)
3. Endocrine System :  
Structure and functions of different endocrine glands.  
Symptoms of deficiency and excess secretion of different endocrine glands.

### **Reference**

1. Guyton. A.C. Hall, J.E. : Text GBook of Medical Physiology – 9<sup>th</sup> 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.

## **MODULE - 7**

### **PHYSIOLOGY (PRACTICAL)**

**Marks - 25**

1. Identification of prepared Slides :  
(a) Tongue (b) Lungs (c) Thyroid (d) Cerebral Cortex (e) Testis (f) Ovary (g) Kidney (h) Liver (i) Pancreas (j) Small intestine – Deodenum, Ilium, Jejunum, (k) Large Intestine, (l) Spinal cord (m) Cerebellum (n) Uterus.
2. Preparation of blood film and identification of white blood cells, Counting of blood cells.



3. Estimation of Haemoglobin (Colorimetric method).
4. Determination of Bleeding time and clotting time of blood. Blood. Blood grouping.
5. Measurement of Blood pressure and Pulse Rate.
6. Study of Muscle fibres and squamous epithelium.

**Reference :**

1. De Fore : Atlas of Histology.
2. Physiological society of India : Laboratory Notebook.
3. Byabaharic Sarir Vidhya – Jyogen Dev Nath.
4. Byaboharic Sarir Vidhya – Makul Kanti Manna.

**MODULE - 8**

**FUNDAMENTALS OF FOOD PREPARATION**

**Marks - 25**

1. Processes involved in food preparation.
2. Planning and preparation of adequate meal for different age groups with special reference to different Physiological conditions.

**Part-II (1 year course) - 200 Marks**

**Paper-III (F.M. 100)**

**UNIT – I**

**MODULE – 9**

**COMMUNITY NUTRITION**

**Marks-50**

1. Concept of Community, types of Community, Factors affecting health of the Community.
2. Nutritional Assessment and Surveillance:  
Meaning, need, objectives and importance
3. Nutritional assessment of human:  
Clinical findings, nutritional anthropometry, biochemical tests, biophysical methods.
4. Diet survey :  
Need and importance, methods of dietary survey, Interpretation - concept of consumption unit, individual and total distribution of food in family, adequacy of diet in respect to RDA, concept of family food security.

5. Clinical Signs :  
Need & Importance's, identifying signs of PEM, vitamin A deficiency and iodine deficiency, Interpretation of descriptive list of clinical signs.
6. Nutritional anthropometry :  
Need and importance, standard for reference, techniques of measuring height, weight, head, chest and arm circumference, interpretation of these measurements.  
Use of growth chart.
- 7 International, national, regional agencies and organisations.  
Nutritional intervention programmes to combat malnutrition.

**Reference:**

1. Jelliffe, D. B. : Assessment of the Nutritional Status of the Community; World Health Organisation.
2. Sain, D. R. Lockwood, R., Scrimshaw, N. S. : Methods the Evaluation of the Impact of Food and Nutrition Programmes, United Nations University.
3. Ritchie, J.A.S. : Learning Better Nutrition FAO, Rome.
4. Gopalan. C.; Nutrition Foundation of India, Special Publication service.
5. Beghin, I. Cap. M: Dujardan. B. : A Guide to Nutrition Status Assessment. W. H. O. Geneva.
6. Gopaldas, t. Seshadri, S. : Nutrition Monitoring a Assessment: Oxford University Press.
7. Mason, J. B., Habicht, J. P.; Tabatabai. H. Valverde. U. : Nutritional Surveillance, W.H.O.

**UNIT – II**

**MODULE - 10**

**PUBLIC HEALTH**

**Marks-25**

1. Health and Dimension of Health :  
Positive health Versus absence of disease.
2. Secondary Sources of Community Health data :  
Sources of relevant vital statistics of infant, child & maternal mortality rates.
- 3 Immunization :  
Importance and schedule of Immunization for children, adults and for foreign travels, role of individual, family and

community in promoting health.

4. Community Water and Waste Management :  
Importance of water to the community, etiology and effects of toxic agents, water borne infectious agents, sources of water, safe drinking water, potable water, waste and waste disposal, sewage disposal and treatment, solid waste and disposal, liquid waste disposal.

## **MODULE - 11**

### **EPIDEMIOLOGY**

**Marks-25**

1. Concept of Epidemiology :  
Study of the epidemiologic approach-determinants of disease preventive & social means, vital statistics and their significance.
2. Communicable and infective disease control:  
Nature of communicable and infectious diseases, infection, contamination, disinfections, decontamination, transmission-direct & indirect, vector borne disease infecting organisms and positive agents, environmental agents and epidemiological principles of disease control.
3. Community Food Protection:  
Epidemiology of food borne disease-modes of transmission, control measures and prevention.

#### **Reference:**

1. Smith, G.W. : Preventive Medicine and public health. 2nd edition. Macmillon Co.. New Your.
2. Park : Park's Textbook of preventive and Social Medicine. 9th edition. M/s. Banarasidas Bhanot. Jabalpur.

## **PAPER – IV (F.M. 100)**

### **UNIT - I**

#### **MODULE - 12**

##### **FOOD COMMODITIES(A)**

**Marks-25**

1. Cereals and Millets : Structure, processing, storage, use in various preparation, variety, selection and cost. Cereal products, breakfast cereals, fast food.
2. Pulses and Legumes : Structures, Selection and variety. Storage, Processing and use in different preparations, Nutritional aspects and cost.

3. Milk and Milk products : Composition, Classification, Selection Quality and Cost, Processing, Storage and uses in different preparations, Nutritional aspects, shelf life and spoilage.
4. Eggs : Production, grade, quality selection, storage and spoilage, cost nutritional aspects and use in different preparations.
5. Meat, Fish and Poultry : Types, Selection, Purchase, Storage, Uses, preparations Cost, Spoilage of fish Poultry and meat.
6. Vegetables and Fruits : Variety, Selection, purchase, storage, availability causes and nutritional aspects of raw and processed products and use in different preparations.

### **MODULE-13**

#### **FOOD COMMODITIES (B)**

**Marks - 25**

1. Sugar and sugar Products : Types of natural sweeteners, manufacture, selection, storage and use as preserves, stages in sugar cookery.
2. Fats and oils : Types and sources (animal and vegetable), Processing, uses in different preparations, storage, cost and nutritional aspects.
3. Raising and Leavening agents : Types, constituents, uses in cookery and bakery, storage.
4. Food Adjuncts : Spices, condiments, herbs, extracts; concentrates, essences, food colours, origin, classification, description, uses, specifications, procurements and storage.
5. Convenience Foods : Role, types, advantages, uses, cost and contribution to diet.
6. Salt : Types and uses.
7. Beverages : Tea; Coffee. Chocolate and Cocoa Powder-Processing, cost and nutritional aspects, other beverages-Aerated beverages, juices.
8. Preserved Products : Jams, Jellies, Pickles, Squashes, Syrups- types, composition and manufacture, selection, cost, storage, uses and nutritional aspects.
9. Food Standards : ISI, Agmark, FPO, MPO, PFA.

#### **Reference:**

1. Lavies, S (1998) : Food Commodities Ltd. London.
2. Hughes, O. and Bennion, M (1970); Introductory Foods, Macmillan & Co., New York.

3. Pyke, M. (1974); Catering Service and Technology, John Murrey Pube,' London.
4. B. Shrilakshmi : Food Science
5. Manne Sakuntala : Food Science.

## **UNIT – II**

### **MODULE-14**

#### **COMMUNITY NUTRITION (PRACTICAL)**

**Marks-25**

1. Anthropometric Measurement of infant - Length, weight, circumference of chest, Mid - upper arm circumference, precautions to be taken.
2. Comparison with norms and interpretation of the nutritional assessment data and its significance  
Weight for age, height for age, weight for height, Z scores, body Mass Index (BMI) Waist - Hip Ratio (WHR).
3. Growth charts - plotting of growth charts, growth monitoring and promotion.
4. Clinical assessment and signs of nutrient deficiencies specially PEM (Kwashiorkor, marasmus) I vitamin A deficiencies, Anaemia, Rickets, B-Complex deficiencies.
5. Estimation of food and nutrient intake - Household food consumption data, adult consumption unit, 24 hours dietary recall, 24 hours record.  
Weighment method, food diaries, food frequency data, use of each of the above, information available through each individual, collection of data, estimation of intakes.
6. Community field survey.

### **MODULE-15**

#### **PROJECT FORMULATION (PRACTICAL)**

**Marks-25**

Project formulation and presentation of project in a seminar (specially on the market survey of food commodities).

**Part-III (1 year course)**  
**400 Marks**

**PAPER – V (F.M. 100)**

**UNIT – 1**

**MODULE-16**

**NUTRITIONAL BIOCHEMISTRY (A)**

**Marks-25**

1. Introduction to Biochemistry : Definition, objectives, scope and inter relationship between biochemistry and other biological science.
2. Enzymes: Definition, types and classification of enzymes, definition and types of coenzymes. specificity of enzymes, Isozymes, enzyme Kinetics including factors affecting enzyme action, velocity of enzyme catalyzed reactions, enzyme inhibition.
3. Intermediary metabolism : Carbohydrate Metabolism, Glycolysis, TCA cycle & energy generation, gluconeogenesis, glycogenesis, glycogenolysis, blood sugar regulation.  
Lipids : Oxidation and biosynthesis of fatty acids (saturated & mono-unsaturated) : Synthesis and utilization of ketone bodies, Ketosis, fatty livers.
4. Proteins : General reaction of amino acid metabolism, urea cycle.  
Lipoproteins : Types, composition, role and significance in disease (in brief)

**MODULE-17**

**NUTRITIONAL BIOCHEMISTRY (B)**

**Marks-25**

1. Molecular aspects of transport; Passive diffusion, facilitated diffusion, active transport.
2. Introduction to Nucleic acids: Structure, replication, transcription, genetic code (in brief) elementary knowledge of biosynthesis of proteins.
3. Vitamins : Chemistry and biochemical role of fat soluble vitamins. A. D. E. and K. Water soluble vitamins – B<sub>1</sub>, B<sub>2</sub>, B<sub>6</sub> niacin and C.
4. Minerals : Biochemical role of inorganic elements.

**Reference:**

1. West, E. S., Todd, W. R.; Mason. H.S. and Van Bruggen J.T. :  
4th Ed. Text Book of Biochemistry. Amerind Publishing Co. Pvt. Ltd.

2. Murray, r. K. Grannen, D. K.; Mayes, P. A. and Rodwell. V. W. : Harper's Biochemistry. Lange Medical Book.
3. Handler, P.: Smith E.I.; Stelten, D. W. : Principles of Biochemistry, Me. Grew Hill Book Co.
4. Lehninger, A.L.; Nelson, D. L. and Cox, M. M. Principles of Biochemistry. CBS Publishers and Distributors.
5. Devlin, T. M. : Text Book of Biochemistry with Clinical Co-relations. John Wiley and Sons.
6. Strayer. L. Biochemistry. Freeman W.H. and Co.
7. Assaini. J. Kaur. Text Book of Biochemistry. C.B.S. Publication.

## **UNIT – II**

### **MODULE-18**

#### **FOOD MICROBIOLOGY**

**Marks-25**

1. Brief history of food microbiology and introduction to important micro organisms in foods.
2. Cultivation of microorganisms, Nutritional requirements of micro organisms, types of media used, methods of isolation.
3. Primary sources of microorganisms in foods, physical and chemical methods used in the destruction of microorganism in foods: (Sterilisation & Disinfection).
4. Fundamentals of control of microorganism in foods:  
Extrinsic and intrinsic parameters affecting growth and survival of microbes, use of high and low temperature, dehydration, freezing, freeze-drying, irradiation and preservatives in food preservation.
5. Food Spoilage:  
Contamination and microorganisms in the spoilage of different kinds of foods and such as cereal and cereal products, vegetable and fruits, fish and other sea foods, meat and meat products, eggs and poultry, milk and products, canned foods.
6. Public health hazards due to contaminated foods:  
Food borne infections and intoxications : Symptoms, mode of transmission and methods of prevention, investigation and detection of food borne disease out-break.

### **MODULE - 19**

#### **SANITATION AND HYGIENE**

**Marks-25**

1. Importance of sanitation and hygiene in food, kitchen hygiene, employee's health, food plant hygiene, food laws.

2. Indices of food, milk and water: Sanitary quality, Microbiological criteria of foods, water and milk testing (Bacteriological analysis).
3. Importance of Pest control
4. Hygienic handling of Food
6. Precaution to be taken while handling pesticides.

**Reference:**

1. Prazier, W. C. and Westhoff, D. C. (1988): 4th edition, Food Microbiology, McGraw Hill Inc.
2. Jay James. N. (1986) : 3rd edition, modern Food Microbiology, Van Nestrand Reinhold Company Inc.
3. Peleezar, M.I. and Reid, K. D. (1978): Microbiology, McGraw Hill Company, New York.
4. Benson Harold, J. (1990) : Microbiological Application, Publishers, U.S.A.
3. Colling, C.E. and Lyne, P.M. (1976) : Microbiological Methods Butterworth. London.

**PAPER – VI (F.M. 100)**

**UNIT - I**

**MODULE - 20**

**DIET THERAPY- (A<sub>1</sub>)**

**Marks-25**

1. Basic concepts of diet therapy: Therapeutic adaptations of normal diet, principles and classification of the therapeutic diets.
2. Team approach to health care. Assessment of needs.
3. Routine Hospital Diets: Regular, light, soft, fluid, potential and enteral feeding.
4. Energy modifications and nutritional care for weight management Identifying the overweight and obese, etiological factors contributing obesity, prevention and treatment. Low energy diets, balanced energy reduction and behavioural modifications, Underweight - etiology assessment, high energy diets for weight gain, anorexia nervosa and bulimia.
5. Etiological factors, symptoms, diagnostic tests and management of upper GI tract disease - disease of oesophagus and dietary management, diseases of stomach and dietary management. Gastric and duodenal ulcers and dietary management.



## **MODULE - 21**

### **DIET THERAPY- (A<sub>2</sub>)**

**Marks-25**

1. Diets for febrile conditions, infections and surgical conditions.
2. Etiology, symptoms, diagnostic tests and management of intestinal diseases: Diarrhoea, steatorrhoea, Diverticular disease, inflammatory bowel disease, Ulcerative Colitis, Flatulence, Constipation, Irritable Bowel Syndrome, Haemorrhoids.
3. Anaemias: Pathogenesis and dietary management: Nutritional Anaemias, thalassemia, resulting from Acute Haemorrhage.
4. Diseases of the liver, Exocrine Pancreas and Biliary System. Liver function tests and nutritional care in liver disease in the context of results. Dietary care and management in - Viral Hepatitis, Cirrhosis of liver, Dietary care and management in diseases of Gall Bladder and pancreas-Cholelithiasis, Cholecystitis. Cholecystectomy, etc.

## **MODULE - 22**

### **DIET THERAPY-(B<sub>1</sub>)**

**Marks-25**

1. Diet in disease of the endocrine pancreas:  
Diabetes Mellitus: Classification, symptoms, diagnosis, management -insulin therapy, oral hypoglycaemic agents, glucose monitoring at home, dietary care and nutrition therapy, meal plan (with and without insulin), special diabetic foods, sweetness and sugar substitute.
2. Diseases of the cardiovascular system:  
Atherosclerosis Hyperlipidemias - brief review of Lipoprotein  
Dietary care: Ischemic Heart Disease - nutritional management.  
Hypertension - etiology, prevalence, nutritional management.  
Prevention of cardiovascular diseases and diet.

## **MODULE - 23**

### **DIET THERAPY-(B<sub>2</sub>)**

**Marks-25**

1. Renal Diseases:  
Classification, etiology, symptoms of Glomerulonephritis - dietary management. Acute and Chronic Nephritis - dietary management. Nephrotic syndrome - dietary management. Renal failure and Uraemia - dietary management. Nephrolithiasis - dietary management. Use of sodium and potassium exchange list.
2. Allergies :  
Definitions, symptoms, diagnosis and dietary management - food selection.

**Reference:**

1. Anderson, L., Dibble, M.V., tukki, P.R., Mitchall, H.S., and Rynbergin H. J. : Nutrition in Health and Disease, 17th edition, J. B. Lipincott & Co. Philadelphia.
2. Anita F. P. : Clinical Dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.
3. Mahan, L. K., Arlin, M. T. : Kranse's Food, Nutrition and Diet Therapy. 8th edition, W. B. Saunders Company, London.
4. Robinson. C.H. Lawaler, M.R. Chenoweth, W. L., and Garwick, A. E. (1986): Normal and Therapeutic Nutrition. 17th edition, MacMilian Publishing Co.
5. Williams. S. R.: Nutrition & Diet Therapy, 6th edition, Times Mirror/Mosby College Publishings, St. Louis.
6. Raheena, Begum : A textbook of food, nutrition and dietetics Sterling Publishers, New Delhi.
7. Joshi, S. A. : Nutrition and Dietetics, Tata McGraw Hill, Publications, New Delhi.

**PAPER – VII (F.M. 100)****UNIT - I****MODULE - 24****FOOD SCIENCE (PRACTICAL)****Marks-25**

1. Identification of Mono, Di and Polysaccharides
2. Identification of Proteins (albumin, gelatin, peptone)
3. Identification of glycerol
4. Determination of Acid value, Saponification value of fats and oils.
5. Estimation of amino nitrogen by titrimetric method.

**MODULE - 25****NUTRITIONAL BIOCHEMISTRY (PRACTICAL)****Marks-25****Blood constituents:**

1. Estimation of serum Protein (Biuret rmethod and Lowry method)
2. Estimation of blood Glucose (Folin Wu method)
3. Estimation of Serum inorganic phosphorus (Fiske and SubbaRow method).
4. Estimation of blood creatinine.

**Reference :**

1. An introduction of Practical Biochemistry : D. Plummer
2. Practical Biochemistry : K Wilson and Walker
3. Biochemical Methods : S. Sadasivan and K Manikam

4. Hawk's Physiological Chemistry : B. L. Oser (ed)
5. Practical biochemistry : R. L. Nath.
6. A treatise on Analysis of Food, Fats and Oils : A. R. Sen, N.K. Pramanik and S.K. Roy.

**UNIT - II**

**MODULE - 26**

**FOOD ADULTERATION (PRACTICAL)**

**Marks-25**

1. Detection of Vanaspati in Ghee/Butter.
2. Detection of Khesari flour in besan.
3. Detection of Metanil yellow in turmeric/coloured sweet products.
4. Detection of Argemon oil in edible oil
5. Detection of artificially colour / foreign matter in tea (dust/leaves).

**MODULE - 27**

**FOOD PRESERVATION (PRACTICAL)**

**Marks-25**

1. Different methods of Food preservation – Drying, Freezing, Frying, canning, bottling etc.
2. Aseptic handling : Sources of contamination of foods.
3. Preparation of pickles, tomato sauce, chili sauce, jelli, tomato puree squash etc.
4. Visit to canning industry and dairy firm etc.

**PAPER – VIII (F.M. 100)**

**UNIT – I**

**MODULE - 28**

**DIED THERAPHY (A<sub>1</sub>) (PRACTICAL)**

**Marks-25**

1. Planning and preparation of normal diets.
2. Planning and preparation of fluid diets.
3. Planning and preparation of soft/semi solid diets.
4. Planning and preparation of high protein diets.
5. Planning and preparation of low fat and low caloric diets.
6. Planning and preparation of high fibre diets.

**MODULE - 29**

**DIED THERAPHY (A<sub>2</sub>) (PRACTICAL)**

**Marks-25**

Planning and preparation of Diets for the following diseases:

- Diabetes mellius
- Peptic ulcers,
- Viral hepatitis,
- CHD
- Gout
- Anemias.