

No.AC.2(S)/384/14-15

Dated: 10-06-2015

**NOTIFICATION**

**Sub:** Minor modification in the existing syllabus B.Sc. in Food Science & Nutrition & Nutrition and Clinical Nutrition & Dietetics.

**Ref:** 1. Proceedings of Faculty of Science & Technology Meeting held on 02-02-2015.  
2. Proceedings of the Meeting of Academic Council held on 27-03-2015.

The Board of Studies in **Food Science & Nutrition (UG)** at its meeting held on 03-12-2014 has resolved for some minor modification in the existing syllabus B.Sc. in Food Science & Nutrition and Clinical Nutrition & Dietetics is given below.

**Minor modifications in UG course- BSc - Food science & Nutrition [one option]**

Course	Semester & paper title	Existing	Revised (minor modifications)
Food science & Nutrition [as one option]	III 3.3 Principles of Nutrition -I	UNIT 2	Distribution of water and electrolytes, water-functions, requirements, sources and water balance
	IV 3.4 Principles of Nutrition-II	UNIT 4 Glycemic index and glycemic response is deleted	Deleted
		UNIT 6 * Methods of determining protein quality – PER/growth study, NPU, BV, NDP calcs, chemical score*	Deleted
		UNIT 1 Water and electrolytes – functions, requirement, sources and balance.	Deleted

**Minor modifications in UG course- Clinical Nutrition & Dietetics**

Course	Semester & paper title	Existing	Revised (minor modifications)
Clinical Nutrition & Dietetics]	I	Paper title - Applied Physiology	<b>Basics of human Physiology I</b>
	II	Paper title – Food Microbiology	Deleted  Replaced paper title and course content as- <b>Basics of human physiology-II</b>

Address : UNREG  
Telephone No. : 2419677/2419361  
Fax : 0821-2419363/2419301

e-mail : registrar@uni-mysore.ac.in  
www.uni-mysore.ac.in

UNIVERSITY OF MYSORE



Estd. 1918

VISHVAVIDYANILAYA, KARVA SODHA  
CRAWFORD HALL, POST BOX NO. 408  
MYSORE-570 005

The Faculty of Science and Technology and the Academic Council at their meetings held on 02-02-2015 and 27-03-2015 respectively have approved the above proposals and the same is notified.

The copy of modify in the existing syllabus B.Sc. in Food Science & Nutrition & Nutrition and Clinical Nutrition & Dietetics is annexed.

**DRAFT APPROVED BY THE REGISTRAR**

*[Handwritten signature]*  
16/6  
**REGISTRAR**  
*[Handwritten initials]* 12/6/15 *[Handwritten initials]* 12/6/15

To

1. The Registrar (Evaluation), University of Mysore, Mysore.
2. The Chairperson, BOS/DOS in Food Science & Nutrition, MGM.
3. The Dean, Faculty of Science & Technology, DOS in Earth Science, MGM.
4. The Principals of the Affiliated Colleges running B.Sc. in Food Science & Nutrition & Nutrition and Clinical Nutrition & Dietetics course
5. The Director, College Development Council, UOM, Mysore.
6. The Coordinator, Online & Outreach programme, Parakalamatta, MGM.
7. The Deputy/Assistant Registrar (Evaluation), University of Mysore, Mysore.
8. The Supdt, A.B., Academic Section / PMEB, UOM., Mysore.
9. The P.A. to the Vice-Chancellor/Registrar/Registrar( Evaluation), UOM., Mysore.
10. The Case Worker, AC.7, Academic Section, University of Mysore, Mysore.
11. The Section Guard File(Supdt.AC.2), A.B., A.C., UOM.
12. The Schedule File.

## CLINICAL NUTRITION AND DIETETICS

### I SEMESTER

#### 1.4 BASICS OF HUMAN PHYSIOLOGY – I

42Hrs

<b>UNIT 1:</b> Introduction to human body –Definition of Anatomy and physiology, Body fluids, Cell, Tissue of the body	6
Skeletal system – Function, types of bones, classification of bones, and growth of Long bone (any one long bone femur).	6
<b>UNIT 2:</b> Blood and circulatory System	
(a)Composition of blood- WBC, RBC, Platelets –Structure, formation and function, coagulation, of blood ,blood groups and Rh factor	
(b)Heart – Structure, and functions, blood pressure, types of circulation, principle blood vessels-structure and function	10
<b>UNIT 3:</b> Digestive system	8
a) Teeth and mastication	
b) Structure and functions of salivary glands, pharynx, esophagus, stomach, small and large intestine.	
c) Duodenum, liver and gall bladder, pancreas.	
d) Process of digestion and absorption.	
<b>UNIT 4:</b> Respiratory system	6
a) Respiratory passages	
b) Physiology of respiration; rate and control	
<b>UNIT 5:</b> Organs of special senses: Tongue, nose, ear, eyes and skin-structure and function.	6

#### 1.4 PRACTICALS: BASICS OF HUMAN PHYSIOLOGY – 1

3hrs/week

1. Introduction to microscope.

2. Identification of tissues slides – bone, blood, epithelial tissues, muscular tissues. Heart and lung, stomach and intestine
3. Blood clotting time (both methods) and bleeding time(Duke’s method)
4. Blood groups and Rh factor.
5. Estimation of hemoglobin- Sahli’s method
6. Enumeration of RBC / WBC, Differential count of WBC

## II SEMESTER

### 2.4 BASICS OF HUMAN PHYSIOLOGY – II

**45 Hrs**

- |  |           |
|--|-----------|
| <b>1: Endocrine system</b>   | <b>12</b> |
| a) Structure & function – Hypo & hyper secretory effect of pituitary, thyroid, parathyroid & adrenal gland                               |           |
| b) Pancreas -alpha, beta cells   |           |
| <b>2: Excretory system</b>   | <b>8</b>  |
| a) Structure of kidney and its functions   |           |
| b) Structure of nephron and its functions (formation of urine)   |           |
| c) Composition of urine  |           |
| d) Regulation of water and acid base balance.  |           |
| <b>3: Nervous system</b>   | <b>6</b>  |
| a) Nerve cells, nerve fiber-types, structure   |           |
| b) Brain and spinal cord-structure and function  |           |
| c) Types of nervous system(in brief)   |           |
| <b>4: Reproductive system</b>  | <b>8</b>  |
| a) Male and Female organs of reproduction-structure & function, puberty, menarche, fertilization, Conception and menopause. Sex hormones |           |
| b) Mammary glands – structure & physiology of milk production.   |           |
| <b>5: Immune system</b>  | <b>2</b>  |
| a) Lymphatics, spleen and reticulo - endothelial system  |           |

- b) Types of immunity
- 6: Human genetics – Inheritance & variations 2

### **PRACTICALS:**

#### **2.4 BASICS OF HUMAN PHYSIOLOGY-II 3Hrs/week**

1. Identification of tissues – endocrine, excretory, reproductive system and special senses.
2. Determination of ESR – demonstration.
3. Determination of body temperature.
4. Determination of pulse rate and heart rate.
5. Determination of blood pressure– demonstration.
6. Urine analysis – microscopic observation, pH, glucose, and albumin.
7. Visit to Anatomy physiology and/ pathology units (depending up on availability and permission from external Institute)

### **III SEMESTER**

#### **3.3 HUMAN NUTRITION 42hrs.**

1. Introduction to nutrition: - Functions of foods. Definition of nutrition and nutrients. Adequate. Optimum and good nutrition. Malnutrition. 3
2. Water- Physiological functions of water, sources, total body water and body compartments. Water and electrolyte balance. 5
3. Carbohydrates – Composition, classification, foods sources, functions, digestion, absorption, and storage. 8
4. Energy-determination of energy content of foods, Bomb calorimeter, BMR and its determination, factors affecting BMR. 6
5. Proteins – Composition, sources, functions, essentials and non essentials amino acids, deficiency, digestion, absorption, transport, utilization and excretion of proteins. 4
6. Fats and Oils – Composition, Sources, functions, saturated and unsaturated fatty acids, digestion, absorption, transport, storage, production of ketone bodies. 8
7. Micronutrients –

- Minerals- Function, sources, bioavailability, and deficiency of calcium, iron, iodine, fluoride, magnesium, zinc, sodium and potassium.
- Vitamins – classification, sources, units of measurements, functions, and deficiency of the fat-soluble and water soluble vitamins.

### 3.3 PRACTICALS- HUMAN NUTRITION

3hrs/week

1. Recording weight of raw vegetables and fruits as purchased from the market and determining the edible portion by weight.
2. Different methods of cooking-boiling steaming, stewing, frying, baking and pressure cooking – Basic food preparations and portion size. (Snacks, Desserts, Salads, beverages Indian and western).
3. Home made preserved products.
4. Calculation of average nutrient content of the given food stuffs with reference to calories, proteins, fats, carbohydrates and presenting in the form of a table for all food groups.
5. Identification and preparation of a table regarding rich sources of dietary fiber, PUFA, calcium, iron, vitamin A, thiamine, riboflavin, folic acid and ascorbic acid.

## IV SEMESTER

### 4.3 FOOD COMMODITIES

42hrs

1. Cereals and millets – Structure, Breakfast cereals, cereal products. 6  
Use of cereals in Variety of preparations, fermented foods, Nutritional aspects – effect of cooking.
2. Pulses and legumes-Nutritional composition, Variety, use in preparations. Effect 6  
of Cooking.
3. Milk and milk products – Composition, classification, quality, uses; 6  
Nutritional aspects an processing of milk and curd, buttermilk, paneer, khoa, cheese, ice cream, kulfi and various kinds of processed milk, effect of heat on milk.
4. Eggs – Grade, Quality, uses, Nutritional aspects, effect of cooking. 4

- |  |   |
|--|---|
| 5. Fish, poultry and Meat – Selection, Nutritional aspects, classification, effect of added substances. Spoilage of fish, poultry and meat, Salting and curing. effect of cooking. | 5 |
| 6. Vegetables and Fruits – Variety, Nutritional aspects.   | 4 |
| 7. Sugar and Sugar products – Manufacture of sugar and jaggery, use of sugar in Preserved products.  | 4 |
| 8. Fats and Oils – Types and sources, Manufacture, Nutritional aspects. Change on cooking. Effect of prolong heating on its nutritive value.                                       | 5 |
| 9. Factors affecting food acceptance.  | 2 |
| 10. Sensory testing of food quality – a. threshold test, b. Difference test, c. Ranking. d. scoring e. Hedonic f. acceptance and preference tests.                                 |   |

#### **4.3 PRACTICALS - FOOD COMMODITIES**

3hrs/week

1. Cereals, pulses, vegetables, fruits and greens – Effect of cooking in hard water, soft water and addition of acid/alkali into the cooking media.
2. Egg cookery – Grading of eggs, Effect of boiling on ferrous sulphide formation, Steaming- preparation of custard.
3. Milk cookery – Assessing milk quality, Effect of boiling, curdling and fermentation. (Any one recipe preparation)
4. Sugar cookery – Stages of sugar cookery. One recipe preparation.
5. Fats and oils – Heating of oil, frying of papads at different temperature.
6. Identifying processing techniques. E.g. Wheat, Maida, extruded products, semolina, and various other products.

## V SEMESTER

### 5.1 ELEMENTARY DIETETICS

42 hrs

1. Role of nutrition in community's health and national development. 3
2. Methods to assess nutritional status. Direct methods – Diet surveys, anthropometry, clinical and biochemical assessments. Indirect methods-food balance sheet and agriculture data and vital statistics. 6
3. Nutrient requirements for various age and sex – RDA, nutrient requirements for adult men and women. Additional requirements during pregnancy and lactation. Nutrient requirements for infants, preschool, School children, adolescents and elderly. 10
4. National strategies to combat malnutrition and role of various national Institutes – ICDS, Midday meal program, School meal programs, ICAR, NIN, NNMB,CSIR,ICMR,CFRTI..Etc (in brief) 5
5. Role of dietitian – Interpersonal relationship with patients, team approach in nutritional care. 3
6. Fundamentals of diet therapy – Definition of normal and therapeutic diets. 8  
Routine hospital diets – fluid diets, soft diets, and regular hospital diets.  
Special feeding methods-oral feeding, enteral feeding, parental feeding techniques
7. Diet in fevers and infection. 3
8. Diet in burns and surgical conditions. 4

### 5.4 CLINICAL NUTRITION AND. DIETETICS 3Hrs/week

1. Diet in the diseases of the gastro intestinal tract – etiology, symptoms, and diagnostic tests. 10

Treatment and dietary modification:

- a. Gastritis, peptic ulcer.
- b. Diarrhea and constipation.



- c. Celiac disease, tropical sprue, mal absorption syndrome and ulcerative colitis.
- d. Liver diseases – Hepatitis, Cirrhosis, Hepatic coma. Role of alcohol in.
- e. Liver disease – Cholecystitis and cholelithiasis.
- f. Pancreatitis.

2. Diet in metabolic disorders- 10

- a. Diabetes mellitus – types, symptoms, predisposing factors, diagnostic test, metabolism in diabetes, dietary treatment and meal management, hypoglycemic agents – insulin and its types. Complications.
- b. Gout – Causes, symptoms and diet.
- c. Inborn errors of metabolism – Phenylketonuria.

3. Diet in kidney diseases – Basic renal function, etiology, symptoms, diagnostic tests, and dietary treatment of: 8

- a. Glomerulo-nephritis, Nephrosis – Acute and chronic conditions.
- b. Renal failure. dialysis.
- c. Renal calculi – causes, symptoms, diet management. Acid and alkali producing foods and neutral foods.

4. Diseases of the cardio-vascular system – clinical findings related to nutrition, symptoms, etiology, and diet management during: 8

- a. Hyperlipidemia, Atherosclerosis and ischemia-etiology and dietary management
- b. Hypertension – etiology, symptoms and dietary management, Sodium restricted diet, levels of Sodium restriction, and sources of sodium and dangers of sodium restriction.

5. Diet for weight management – causes, classification, assessment, and principles of dietary modification. 3

6. Allergic conditions – Definition, classification, manifestation of common allergic symptoms identification tests and dietary treatment. 3

**5.7 PART-A PRACTICAL – ELEMENTARY DIETETICS 3hrs/week**

- 1. Assessing nutritional status: Measuring height and weight of nursery school children and comparing with the standards.

2. Diet survey – 24 hour recall method for 5 students.

3. Planning and preparations of:

- a. Normal diet
- b. Clear liquid and liquid diet
- c. Soft diet
- d. Diet for fevers/burns/surgical conditions.

## **5.7 PART-B PRACTICAL – CLINICAL NUTRITION AND DIETETICS**

3hrs/week

1. Planning and preparation of special diets:

- a. Bland diet for peptic ulcer
- b. High and low calorie diets.

2. Case study and diet history of diseases.

3. Planning and preparation of diets for:

- a. Viral hepatitis and cirrhosis of the liver.
- b. Diabetes mellitus
- c. Nephritis, nephrotic syndrome and renal failure.
- d. Cardio-vascular diseases, and congestive heart failure.

## **VI SEMESTER**

### **6.1 FOOD SERVICE MANAGEMENT**

42hrs

1. A) Organization of food service management – Definition, Various types of Food Service institutions, their characteristics and functions. a. Commercial – Hostel, Canteen, Cafeteria, b. Welfare – Hospitals, hostels, boarding homes, home for children/elderly and industrial canteen. C. Transport – Air, Rail, Sea.

B. General principles of organization and management, Types of organization, tools of management, administration, leadership, problems. 10

2. Equipment in Food service – Classification, Factors to be considered in selection of equipment for food storage, preparation, serving, dish washing & laundering. 8

3. Physical layout – Planning a food service unit, layout design, planning of different work areas – preparation, cleaning, storing, serving and dining areas. 6

Lighting and ventilation, working heights in relation to equipment.

Plant and equipment management – maintenance, sanitation, safety and security.

4. Menu Planning – Principles involved in menu planning, different kinds of menus. 10

Budgeting and cost control, Total budget – food budgets, labor cost and overheads.

Definition for cost Control, food cost, factors to be considered in cost control, selling price, total income inventories, records for indenting food receipts and issues.

5. Quality food Service – types-Centralized, de-centralized objectives. Styles of service.

6. Personnel Management- selection, training and supervision of personnel, labour policies and legislation. 3

## **6.4 ENTREPRENEURSHIP**

42hrs

1. Importance of entrepreneurship and its relevance in career growth 8

a. Entrepreneur, entrepreneurship and enterprise

b. Types of enterprise.

c. Charms of being an entrepreneur,

d. Creativity and innovation and

e. Problem solving.

2. A. Small scale industry sector and its role in economic development. 7

a. Planning a small scale industry.

- b. Schemes and assistance of Support agencies – banks, SFC, etc.
  - B. Perceiving a business opportunity,
    - a. Identification and selection of business.
    - b.Environment,
    - c. Scanning,
    - d. Sources of information.
  - 3. A. General Management – 6
    - a. Introduction to management,
    - b. Key aspects of managing a small enterprise-production, financial, material management and marketing.
    - c. Market survey-concept and practice. Preparation of a questionnaire.
  - B. Management of Working Capital – Concept of working capital. Factors to be controlled, Tools and techniques.
  - 4. Business Plan – importance, Content, Preparing a business plan. 7
    - a. Business Communication – importance, Oral and written communication-improvement exercises.
    - b. Inter-personal relationship- Concept, importance and development.
  - 5. A. Books of accounts – Importance of accounting assessment, Different books, Accounting Stationery, Operating mechanism. 6
  - B. Financial Statements - Importance and interpret action, Profit and loss account, Balance Sheet, Cash – flow and fund flow.
  - 6. A. Marketing Management- Marketing for small business, Sales promotion – Strategies, tools and techniques, pricing policy. 8
  - B. Export marketing – Understanding international business environment, Do’s and don’t for exports.
- Legal implication – Income tax, Sales, excise, Labour laws, factory act, etc.

**6.7 PART-A PRACTICAL - FOOD SERVICE MANAGEMENT** 3hrs/week

1. Preparation and service of –
  - a. Indian dishes – cereals, pulses & vegetables based preparations, Sweets and desserts.
  - b. Western – soups, sauces, entrees, bakery products, types of icing, beverages.
  - c. Table setting and service.
2. Cleaning and maintenance of metal, glass, wood, flower pots, upholstery, sink and lighting fixtures.
3. A market survey of the locally available food service equipment.
4. Visit to the following institutions to observe organization and management of food services and write a report with an emphasis on the following aspects – Physical Layout, equipment, personnel, purchasing, storage, preparation, service, hygiene and sanitation in hotel, industrial canteen, hostel boarding home, railway canteens (any three).

**6.7 PART – PRACTICAL – INTERNSHIP** 3hrs/week

1. Internship in a hospital/hotel/canteen and preparation of a project report.

# FOOD SCIENCE AND NUTRITION – AS ONE OPTION

## I SEMESTER

### 1.4 HUMAN PHYSIOLOGY – I

42 Hrs

**1. Introduction to human body** – a) Definition of Anatomy and Physiology, Body fluids, Cell, Tissues of the body. (6)

b) Skeletal system – Functions, types of bones, growth of long bone (6)

**2. Blood and circulatory system (10)**

a) Blood – composition, RBC, WBC, Platelets – structure, formation and function, coagulation of blood, blood groups and Rh factor.

b) Heart – structure and function, circulation of blood and blood pressure

c) Principle blood vessels.

**3. Digestive system (6)**

a) Teeth and mastication, b) Structure and functions of salivary glands, Pharynx, oesophagus, stomach, small and large intestine, c) Duodenum, liver and gall bladder, pancreas, d) Process of digestion and absorption.

**4. Respiratory system (6)**

a) Respiratory passages

b) Physiology of respiration – rate and control

**5. Organs of special senses - (6)**

Tongue, Nose, Ear, Eye and Skin- Structure and function.

#### **1.4 HUMAN PHYSIOLOGY – I - PRACTICALS**

1. Introduction to microscope
2. Identification of tissue slides – skeletal, digestive system, heart, lungs
3. Bleeding and clotting time (both methods)
4. Blood groups and Rh factor
5. Estimation of hemoglobin (Sahli's method)
6. Enumeration of RBC, WBC, Differential count of WBC

### **II SEMESTER**

#### **2.4 HUMAN PHYSIOLOGY – II**

**42 Hrs**

##### **1. Endocrine system**

**(12)**

a) Structure and functions – hypo and hyper secretory effect of pituitary, thyroid, parathyroid and the adrenal glands.

b) Islets of Langerhans

##### **2. Excretory system**

**(8)**

a) Structure of kidney and its functions

b) Structure of Nephron and its functions- formation of urine

c) Composition of urine

d) Regulation of water and acid-base balance.

**3. Nervous system (6)**

a) Nerve cells, nerve fiber – types, structure

b) Brain and spinal cord – structure and function

c) Types of nervous system (on brief)

**4. Reproductive system (8)**

a) Male and female organs of reproduction structure and function, puberty, menarche, reproduction (conception, fertilization) and menopause.

b) Mammary glands – structure and physiology of milk production

**5. Immune system (6)**

a) Lymphatic, spleen and reticulo endothelial system

b) Types of immunity

**6. Human genetics – inheritance and variations (2)**

**2.4 HUMAN PHYSIOLOGY – II – PRACTICALS**

1. Identification of tissues – endocrine, excretory, nervous, reproductive system

2. Determination of ESR – demonstration

3. Determination of body temperature

4. Determination of blood pressure (under various positions) – demonstration

5. Urine analysis – microscope observation, Ph, glucose and albumin

6. Visit to anatomy and physiology units of medical college



### III SEMESTER

#### 3.3 PRINCIPLES OF NUTRITION- I

42 Hrs

**1. Introduction to Nutrition**-history, definition and its relation to health (2)

**2. Body composition** (6)

a) Distribution of water and electrolytes, water- functions, requirements, sources and water balance

b) Chemical composition, body compartments- lean body mass, fat mass

c) Methods of studying body composition (in brief).

**3. Energy**- forms of energy, sources and unit of measurements (6)

a) Determination of energy content in foods (Bomb calorimeter), physiological fuel values (At water factors), energy expenditure at rest (BMR/RMR), methods of determination of BMR

b) Factors affecting energy expenditure for physical work, energy cost of physical activities, post-prandial thermogenesis.

**4. Carbohydrates**- (10)

a) Classification (available, non-available), dietary sources, functions, digestion, absorption, transport and utilization, excretion.

b) Dietary fiber – types, properties, sources and its role.

**5. Lipids** (8)

a) Classification, sources, composition, distribution – visible and invisible, functions, digestion, absorption, transport and utilization, storage and excretion.

b) Essential fatty acids - sources, function and effect of deficiency.

c) Cholesterol – sources, functions and health implications.

**6. Proteins** (10)

a) Classification, essential and non-essential amino acids, sources- animal /vegetable protein for growth and maintenance, composition, functions, digestion, absorption, transport and utilization, storage and excretion.

b) Protein energy malnutrition

### **3.3 PRINCIPLES OF NUTRTION- I- PRACTICALS**

1. Food groups: calculation of mean energy, carbohydrates, protein, fat and dietary fiber content of foods using ICMR Tables. Preparation of a table for all the food groups and identification of their role to Indian diet.

2. Standardization of household measures and hand measures- dry and liquid measures.

3. Identification and preparation of macro nutrient dense recipes and calculation of nutrient contents fir the same.

## **IV SEMESTER**

### **4.3 PRINCIPLES OF NUTRITION- II**

**42 Hrs**

#### **1. Minerals-**

**(18)**

Classification, functions, sources, dietary requirements, biological availability, body stores, effects of deficiency, toxicity of – Calcium, Phosphorous, Iron, Copper, Iodine, Fluoride, Zinc, Chromium, Magnesium.

#### **2. Vitamins**

**(18)**

History, classification, functions, sources, dietary requirements, biological availability, body stores, effects of deficiency, toxicity of – Fat soluble vitamins – A,D,E,K and water soluble vitamins – Thiamine, Niacin, Riboflavin, Folic acid, Vitamin B<sub>12</sub> AND Ascorbic acid.

#### **3. Recommended dietary allowances for Indians (ICMR)**

**(6)**

a) Brief knowledge of derivation of RDA, its applications and limitations

b) Food groups and their uses.

#### **4.3 PRINCIPLES OF NUTRITION- I- PRACTICALS**

1. Identification of rich sources of vitamin –A, Calcium, Iron and Ascorbic acid. Preparation of nutrient dense recipes of the same. Calculation of its nutrient content.

2. Determination of edible portions of fruits and vegetables as purchased from the market. Calculation of percent edible portion and its nutrient content.

### **V SEMESTER**

#### **5.1 FOOD SCIENCE**

**42 Hrs**

##### **1. A. Cereal and cereal products**

**(6)**

a) Structure and composition of rice and wheat grains

b) Starch, nature and effect of cooking

c) Dough development and use in various preparations.

##### **B. Legumes and oilseeds**

**(6)**

a) Structure of bean seeds

b) Composition of legumes

c) Factors affecting the cooking quality of pulses

d) Oilseed meal and their

##### **2. Vegetables and fruits**

**(6)**

a) Classification of fruits and vegetables

b) Effects of cooking on color, texture and acceptability

c) Browning reaction and its prevention

**3. A. Milk and milk products (6)**

a) Composition of milk

b) Factors affecting the quality

c) Use of milk and its products

**B. Eggs (6)**

a) Structure, composition and grading for quality

b) Factors affecting the quality

c) Effect of cooking on egg quality

c) Use of eggs in Indian preparation

**C. Meat, poultry and fish (6)**

a) Structure of muscle and meat quality

b) Post-mortem changes

c) Factors to be considered in selection and preparation of meat, poultry and fish

**4. Fats and oils (4)**

a) Physico-chemical properties of fats and oils

b) Functions of fat in food

c) Importance of smoking point and its application

d) Rancidity in fats substitutes/ speciality fats

**5. Sugar and confectionary (4)**

Crystallization of sugar and its application in food preparations

**6. Fermented foods (4)**

Physical and chemical changes during fermentation with example of traditional food – idli, dosa, dhoklas and bread.

## V SEMESTER

### 5.1 FAMILY NUTRITION

42 Hrs

#### 1. A. Food habits of family and community-

(4)

Factors affecting food habits and consumption pattern of different age groups in India – pregnant women, lactating mother and children.

#### B. Methods of assessing nutritional status

(6)

a) Indirect methods – Demography, Vital statistics, Mortality and morbidity patterns, Literacy rate, Unemployment rate, Socio –economic profile.

b) Direct methods –Anthropometry, Clinical assessments, Biochemical estimations, diet survey. (Reference standards)

#### 2. Nutrition during pregnancy and lactation

(6)

a) Pregnancy – physiological stages of pregnancy, complications of pregnancy, nutritional requirements, food selection.

b) Lactation – physiology of lactation, nutritional requirements.

#### 3. Nutrition during infancy and early child hood

(6)

a) Infancy – Growth and development, nutritional requirements, breast feeding, infant formula, Weaning and supplementary foods.

b) Early child hood – (toddler / preschool) growth and nutrients requirements, feeding patterns.

#### 4. Nutrition during school years and adolescence

(6)

a) School children – Nutritional requirement – Importance of snacks, school lunch, Nutritional problem in school age child.

b) Adolescence – growth and nutrient needs, food choices, eating habits, factors influencing.

**5. Nutrition of adults and elderly**

**(6)**

a) Adult hood – food and nutrient requirements. Nutrition related problems.

b) Elderly – Factors affecting food and nutrient use. Nutrient needs. Nutrition related problems.

**6. Prevalence of nutrition problems and inter programmers**

**(6)**

a) Prevalence of nutritional problems in India with special reference to pre-school children and women, Energy protein malnutrition. Nutritional Anaemia, deficiencies of vitamin A, Iodine, Fluorine and other vitamin and mineral deficiencies .

b) Nutritional intervention programmes – Supplementary feeding. School lunch, Anaemia and vitamin A prophylaxis, Goiter control programmes, Integrated Child Development service. Nutrition and health Education, Food supplementation, Fortification and enrichment (belief)

**5.7 FOOD SCIENCE - PRACTICAL-A**

**1. Cereals -**

(a) Microscopic examination of starch molecules,

(b) Gelation of cereal flours (compare the time taken for gel formation )

(c) Observation of cooking time and quality of aged and parboiled rice

**2. Pulses –**

Effect of soaking, sprouting, addition of acid and alkali on cooking quality. (Any one or two pulses like green grams, Bengal gram, cow pea etc.,)

**3. Vegetable and fruits –**

a) Effect of adding acid and alkali on green , red , yellow and white vegetables.

b) Methods of preventing browning

#### **4. Milk and milk products –**

Factors affecting curdling of milk (demonstration) separation of cream and preparation of paneer and khola (demonstration)

#### **5. Eggs -**

a) Demonstration of grading eggs for quality

b) Ferrous sulphate formation and prevention

c) Effect of beating egg while on stiffness of foam and its uses (custard and omlett)

#### **6. Sugar cookery –**

Determination of stages of crystallization and its uses.

#### **7. Oils –**

Smoking points of oils.

### **5.7 FOOD SCIENCE - PRACTICAL-B**

#### **1. Nutritional anthropometry –**

a) Taking measurement of height, weight and mid arm circumference of individual student in the class and comparing them with norms .

b) Taking the above measurement on pre-school children of nursery school and comparing with NCHS standard, interpretation of data.

2. Planning, calculation and evaluation of normal diets for adults (men and women) pregnant women, lactating women, elderly, pre- school adolescent (boys and girls) family.

3. Planning, preparation and evaluation of different types of weaning food and comparing with commercial weaning foods in terms of nutritive value and cost.

4. Visit to Anganwadi and other community centers to observe their activities.

## VI SEMESTER

### 6.1 FOOD PROCESSING AND QUALITY CONTROL

42 Hrs

#### 1. Importance of food processing and preservation (6)

- a) Types and its uses of processing
- b) Causes of food spoilage, principles of preservation
- c). Preprocessing techniques involving physical and chemical changes in foods

#### 2. General characteristic of micro organisms and their importance in foods (8)

- a) Factors affecting their growth and destruction
- b) Food spoilage and quality deterioration contamination sources and types. Cereal and products, sugar and sugar products, vegetables and fruits, meat and meat products, fish and other sea foods, canned foods.

#### 3. Methods of food preservation (10)

- a) Traditional and modern methods.
- b) Different storage methods.
  - Food preservation by heat – pasteurization and canning.
  - Food preservation by using low temperature – freezing and refrigeration.
  - Preservation by drying – sun drying.
  - Preservation using chemical preservatives.
  - Radiation.
  - Preservation by other methods – addition of acid, sugar, salt, oil and spices.
- c) Food additives and fermentation.

#### 4. Principles of food packaging (8)



- a) Food packaging materials and forms
- b) Importance and safety of food packaging
- c) Food and nutritional labeling – information available on labels, international food standards.

**5. Subjective and objective methods of evaluating food acceptability (in brief) (6)**

Introduction to quality control, Evaluation and Assurance, Organisation of Quality Control department.

**6. Food adulteration (4)**

- a) Classification and detection methods of Food Adulterants
- b) Food Laws and Standards, Control of Food Quality, Evaluation of Food safety

**VI SEMESTER**

**6.4 THERAPEUTIC NUTRITION 42 Hrs**

**1. Objective of diet therapy – definition of dietetics and clinical nutrition (4)**

Role of dietitian in hospital and community, importance and mode of dietary counseling.

**2. Method of assessing the nutritional status** of patients, planning, nutritional care for hospitalized patients.

**3. Planning of hospital diets- (10)**

Rationale for modifications of nutrients (protein, calorie, sodium, fat and fiber) and texture – soft and fluid diets, nutrition in surgical conditions and burns.

Special feeding methods – enteral and parenteral feeding, correction/ maintenance of fluid balance.

**4. Dietary management of nutritional disorders (10)**

PEM, Vitamin A deficiency, anaemia and other related disorders- under weight and overweight.

## **5. Dietary management in disorders of organ systems**

**(16)**

- Peptic ulcer, colon disease, constipation and diarrhea
- Liver and gall bladder – hepatitis, cirrhosis
- Cardiovascular – Myocardial infarction, stroke, atherosclerosis, hypertension and heart failure
- Renal – Nephrotic syndrome, acute/ chronic renal failure

## **6. Organization and management of Food service in a hospital and community feeding centers**

**(2)**

### **6.7 FOOD PROCESSING AND QUALITY CONTROL- PRACTICAL –A**

1. Manipulative techniques of food processing – methods of cooking, germination, fermentation and malting.
2. Microscopic observation of micro organism –
  - a) Preparation of bacterial smear and simple staining techniques
  - b) Observation of yeast and molds
3. Sensory methods of evaluating Food Quality – Recognition, Threshold and other simple tests.
4. Preparation of jam and jelly, fruit concentrate, chutneys, pickles, ketchup, dehydrated products (including spice powder), along with demonstration on packaging (standards to be emphasized)
5. Identification of adulterants in common foods
  - Visit to food industry
  - Collection of information from media

### **6.7 THERAPEUTIC NUTRITION - PRACTICAL – B**

1. Assessing the nutritional status of individual in health / sickness using anthropometry and diet history (dietary recall, food frequency as components)

2. Conversion of cooked weights to raw weights, calculation of mean nutritive value – energy, carbohydrate, fat, protein for the food groups and exceptional value (to be used for the diet recall)

3. Planning diets for the hospital dietary

- Regular diet and its modification- convalescent, liquid, energy, protein, fat and sodium.

4. ORT preparation

5. Visit to hospital dietary unit

– Collection of information from media.