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Vishwavidyanilaya Karyasoudha, Crawford Hall, Mysore-570 005. Dated: 19.08.2020

No.AC.2(S)/378/2020-21

NOTIFICATION

Sub: Modifications in the syllabus of B.Sc. Home Science from the Academic Year 2020-21.

Ref: 1. Decision of Board of Studies in Home Science (UG) meeting held on 27.12.2019.

- 2. Decision of the Faculty of Science & Technology Meeting held on 18.02.2020.
- 3. Decision of the Academic Council meeting held on 18.06.2020.

The Board of Studies in Home Science (UG) which met on 27.12.2019 has recommended to make necessary changes in the existing syllabus of B.Sc. Food Science & Nutrition program from the Academic Year 2020-21.

The Faculty of Science and Technology and Academic Council meeting held on 18.02.2020 and 18.06.2020 respectively have approved the above said proposal and the

same is hereby notified.

The modified syllabus of B.Sc. Home Science program is annexed. The contents may

be downloaded from the University Website i.e., <u>www.uni-mysore.ac.in</u>.

Draft approved by the Registrar

Deputy Registrar (Academic), Deputy Registrar (Academic) University of Mysore A Mysore-570 005

To:

- 1. The Registrar (Evaluation), University of Mysore, Mysore.
- 2. The Dean, Faculty of Science & Technology, DoS in Psychology, Manasagangotri, Mysore.
- The Chairperson, BoS in Home Science, DoS in Human Development, Manasagangotri, Mysore.
 The Chairperson, Department of Studies in Human Development, Manasagangotri, Mysore.
 The Director, College Development Council, Moulya Bhavan, Manasagangotri, Mysore.
 The Deputy/Assistant Registrar/Superintendent, AB and EB, UOM, Mysore.
 The P.A. to the Vice-Chancellor/Registrar/Registrar (Evaluation), UOM, Mysore.
 Office file.

Annexure- I

UNIVERSITY OF MYSORE

Choice based credit system of Bachelor's Degree Programme in Food Science and

Nutrition as one option

Semest	SI.	Code	Type of	Title of the paper	Credit	Credit	Hours/	Total	
er	No.	No.	the Paper	or one ballon	pattern	Value	Week	Hours	
-					in L:T:P		L:T:P		
Ι	1.	FSN	DSC -I	Human Physiology	4:0:2	6	4:0:4	8	
II	2.	FSN	DSC –II	Principles of Nutrition	4:0:2	6	4:0:4	8	
III	3.	FSN	DSC –III	Food Commodities	4:0:2	6	4:0:4	8	
IV	4.	FSN	DSC –IV	Family Nutrition	4:0:2	6	4:0:4	8	
	DSE – Any one paper								
-	5.	FSN	DSE –I	Food Processing and	4:0:2	6	4:0:4	8	
V				Preservation					
V	6.	FSN	DSE –II	Food Chemistry	4:0:2	6	4:0:4	8	
-	SEC- Any two from all 3 optional subjects								
-	7.	FSN	SEC – I	Culinary Science-	2:0:0	2	2:0:0	2	
				Principles and techniques					
-	8.	FSN	SEC-II	Nutraceuticals and health	2:0:0	2	2:0:0	2	
				foods					
	DSE - Any one paper								
-	9.	FSN	DSE –III	Product Development	4:0:2	6	4:0:4	8	
VI	10.	FSN	DSE-IV	Diet therapy	4:0:2	6	4:0:4	8	
V I	SEC- Any two from all 3 optional subjects								
	11.	FSN	SEC-III	Nutrition and Fitness	2:0:0	2	2:0:0	2	
	12.	FSN	SEC-IV	Entrepreneurship	2:0:0	2	2:0:0	2	

1. DSC I to IV and DSE I to IV Credit pattern changed from 3:1:2 (3:2:4 Hrs) to 4:0:2 (4:0:4 Hrs) to bring on par with the other optional courses that makes uniformity in handling theory and practical classes.

2. All papers examination pattern need to be followed according to the UOM CBCS regulation.

DSC -I HUMAN PHYSIOLOGY (64Hrs)

4:0:2=6Credits/Week 4:0:4=8 Hrs/Week

UNIT 1: Introduction to human body

A. Definition of Anatomy and Physiology, Body fluids.

B. Skeletal system – Functions, types of Bones, growth of long bone

C. Blood composition, Cellular Elements – structure, formation and function. Coagulation of blood, Blood groups and Rh factor, Heart – Structure and function, Principle Blood vessels and Blood pressure

UNIT 2:

A. Digestive system

Structure and Functions, Process of Digestion and absorption.

B. Excretory system

Structure and Functions of Kidney and Nephron, Composition of urine

UNIT 3:

A. Respiratory system

Structure of lungs, gaseous exchange, Tissue respiration

B. Organs of special senses -

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

C. Nervous system

Brain and spinal cord - Structure and function

UNIT 4:

A. Endocrine system

Structure and functions – Pituitary, Thyroid, Parathyroid, Islets of Langerhans and the Adrenal glands. Hypo and Hyper secretory effect of Pituitary.

B. Reproductive system

Male and female organs of reproduction- Structure and function, Puberty, Menarche, Mammary glands and Menopause.

PRACTICALS DSC -I HUMAN PHYSIOLOGY (64Hrs)

4Hrs/Week

1. Identification of tissue slides – Skeletal, Digestive organs, Blood, Heart, Artery, Kidney, Nephron, lungs, special sense organs, Brain, Spinal cord, Gonads, Gametes, Endocrine glands and Mammary glands.

- 2. Bleeding and Clotting time (Both methods).
- 3. Blood Groups and Rh factor.
- 4. Estimation of Hemoglobin (Sahli's method).
- 5. Enumeration of RBC, WBC and Differential count of WBC.
- 6. Determination of Blood pressure (under different posture) Demonstration.
- 7. Urine analysis Microscope observation, pH, Glucose and Albumin.
- 8. Spotters-Instruments, Reagents and Cellular component of Blood.
- 9. Visit to Anatomy and Pathology units, if permission obtained.

II SEMESTER DSC –II PRINCIPLES OF NUTRTION (64Hrs)

4:0:2=6Credits/Week 4:0:4=8 Hrs/Week

UNIT 1:

- **A. Energy-** Forms of energy, unit of measurement, Determination of Energy content in foods (Bomb calorimeter), Physiological fuel values, Energy Expenditure at rest (BMR/RMR), Methods of Determination and factors affecting BMR.
- **B. Recommended Dietary Allowances for Indians (ICMR)-** Brief knowledge of deviation of RDA, its applications and limitations. Food groups and their uses.
- **C. Carbohydrates -** Classification (available and non-available), Dietary sources, and Functions.

UNIT 2:

- **A. Lipids-** Composition, Classification, Sources- visible and invisible fat, Functions, Essential fatty acids and cholesterol- Sources, Function and Health Implications.
- **B. Proteins-** Composition, Classification, Essential and Non-Essential amino acids, sources and functions. Quality of proteins by different methods.

UNIT 3: Minerals

Classification, Functions, Sources, Dietary requirements, Biological availability, body stores, Effects of deficiency, toxicity of – Calcium, Phosphorous, Iron, Copper, Iodine, Fluoride, Zinc, Chromium, Magnesium, Manganese, Sodium, Potassium and Selenium.

UNIT 4: Vitamins

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 – B complex and C.

PRACTICALS

DSC –II PRINCIPLES OF NUTRTION (64Hrs)

4Hrs/Week

- 1. Standardization of household measures and hand measures- dry and liquid measures.
- 2. Food Groups: Calculation of mean energy, Carbohydrates, Protein, Fat and Dietary Fiber, Minerals and Vitamins content of foods using ICMR Tables. Preparation of mean NV table for all the food groups. Identification of their role in Indian Diet.
- 3. Plan Identification and preparation of Macro and Micro Nutrient dense recipes and calculation of nutrient contents for the same; distribution of same according to RDA for different age groups.
- 4. Determination of edible portions of fruits and vegetables as purchased from the market. calculation of percent edible portion and its nutrient content.

III SEMESTER

DSC –III FOOD COMMODITIES (64hrs)

4:0:2=6Credits/Week 4:0:4=8 Hrs/Week

UNIT 1:

- **A. Cereal and Cereal products -** Structure and Composition of Rice and Wheat grain, Starch, nature and Effect of cooking.
- **B. Legumes and Oilseeds-** Structure of bean legume, Composition of legumes, Factors affecting the cooking quality of Pulses, Oilseed meal and their products.
- **C. Fats and Oils-** Physico-chemical properties of fats and oils, Functions of fat in food, Importance of smoking point and its application, Rancidity in fats substitutes/ speciality fats

UNIT 2:

- **A. Vegetables and Fruits -** Classification and Composition of Fruits and Vegetables, Effects of cooking media on color, texture and acceptability, browning reaction and its prevention
- **B.** Sugar and confectionary Crystallization of sugar and its application in food preparations.

UNIT 3: Eggs, Meat, Poultry and Fish

A) Egg

Structure, Composition, quality, grading of Egg. Effect of cooking and role in cookery.

B) Meat, Poultry and Fish

Structure of muscle, Composition, Classification, Post-mortem changes in meat. Factors considered in selection. Effect of cooking

UNIT 3: Milk and milk products

- a) Composition of milk.
- b) Factors affecting the quality.
- c) Use of milk and its products.

PRACTICAL

DSC -III FOOD COMMODITIES (64Hrs)

4 Hrs/week

1. Cereals - (a) Microscopic examination of starch molecules, Gelation of cereal flours.

2. Pulses – Effect of soaking, addition of acid and alkali on cooking quality.

3. Vegetable and fruits – Effect of adding Acid and Alkali on pigments. Browning reaction and prevention.

4. Eggs- Demonstration of grading eggs for quality, Ferrous Sulphide formation and prevention. Effect of beating egg white on stiffness of foam and its uses (Custard and omlette)

5. Oils – Smoking points of oils and its uses.

6. Milk and Milk products –Separation of cream and preparation of paneer and khoa (demonstration).

7. Sugar cookery – Stages of Crystallization and its Uses.

IV SEMESTER

DSC -IV FAMILY NUTRITION (64Hrs)

4:0:2=6Credits/Week 4:0:4=8 Hrs/Week

UNIT 1: Assessment of Nutritional Status- direct and indirect methods

UNIT 2: Nutrition during Pregnancy and Lactation

a) Pregnancy– Physiological Stages of Pregnancy, Complications of Pregnancy, Nutritional requirements, Food selection.

b) Lactation – Physiology of Lactation, Nutritional Requirements.

UNIT 3: A. Nutrition during Infancy and early child hood

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

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

B. Nutrition during School years and Adolescence

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, eating disorders.

UNIT 4: Nutrition of Adults and Elderly

a) Adult hood – food and nutrient requirements.

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

PRACTICALS

DSC -- IV FAMILY NUTRITION (64Hrs)

4Hrs/Week

Assessment of Nutritional Status by different methods. - Nutritional Anthropometry

 a) Self assessment – Taking measurement of Height, Weight and Mid-arm circumference of individual and comparing them with norms

b) Group assessment –

(i) Measurement of Height, Weight and Mid-arm circumference of individual student in the class and comparing them with norms and Interpretation of data

ii) Taking the above measurement of Pre-school children/Anganwadi and comparing with NCHS standard, Interpretation of data

2. Planning, Calculation and Evaluation

Normal diets for adults (men and women) pregnant women, Lactating mother, Elderly, Pre- school Adolescent (boys and girls) family.

3. Planning, Preparation and Evaluation.

Different types of weaning food and comparing with commercial weaning foods in terms of nutritive value and cost.

4. Visit to community center/ Anganwadi to observe their activities.

V SEMESTER

(Among DSE- students need to opt One paper in V Semester)

DSE –I FOOD PROCESSING AND PRESERVATION (64Hrs) 4+0+2=6Credits/Week

4+0+4=8Hours/Week

UNIT 1: Importance of Food Processing and Preservation

- 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

UNIT 2: General characteristic of microorganisms and their importance in foods

- 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.

UNIT 3: Methods of food preservation

- 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.

UNIT 4: A. Principles of food packaging

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

B. Food adulteration

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

PRACTICALS

FOOD PROCESSING AND PRESERVATION (64Hrs) 4 Hrs/Week

- 1. Manipulative techniques of food processing- Methods of cooking, Germination, Fermentation and Malting.
- 2. Microscopic observation of micro organisms.a) Preparation of bacterial smear and simple staining techniquesb) Observation of yeast and molds
- 3. Preparation of jam and jelly, fruit concentrate, chutneys, pickles, ketchup, dehydrated products (including spice powder), along with demonstration on packaging (standards to be emphasized)
- 4. Identification of adulterants in common foods
 - Visit to food industry
 - Collection of information from media

DSE-II FOOD CHEMISTRY

UNIT 1: Carbohydrates

-Definition, Classification, Structure and properties of Monosaccharides, Disaccharides, Polysaccharides

Glycolysis, Gluconeogenesis, Glycogenesis, Glycogenolysis, Blood sugar regulation

UNIT 2: Lipids

-Definition and classification, types and properties of Fatty acids, Composition and properties of fats, significance of acid value, Iodine value and Saponification value -Classification and structure of Phospholipids, structure of Glycolipids, types and structure of Sterols

-Oxidation and biosynthesis of fatty acids. Synthesis and utilization of ketone bodies, ketosis, fatty livers

UNIT 3: Proteins

-Definition, Classification, structure and properties of Amino acids, Essential and non-essential amino acids

- Definition, classification, structure, properties and functions of proteins

-General reactions of amino acid metabolism, urea cycle

UNIT 4:

A. Enzymes

Definition, types and classification of enzymes and coenzymes, specificity of enzymes, Isozymes, enzyme kinetics including factors affecting velocity of enzyme catalyzed reactions, enzyme inhibition.

B. Biological Oxidation-Citric acid cycle, Electron transport chain

Oxidative phosphorylation, energy conservation, high energy phosphate bond.

FOOD CHEMISTRY-PRACTICALS

1. Carbohydrates

-Reactions of Mono, Di and Polysaccahrides and their identification in unknown mixture

-Estimation of reducing and total sugars in foods

- -Estimation of lactose in milk
- 2. Fats

-Reactions of fats and oils

-Determination of acid value, Saponification and Iodine number of natural fats and oils

-Estimation of crude fat content of foods by soxhlet's method (if lab equipped).

3. Proteins

-Reactions of proteins in foods

-Reactions of amino acids and their identification in unknown mixtures

-Estimation of total N of foods by Kjeldahl method (if lab equipped).

4. Enzymes

-Effect of pH and temperature on enzyme activity-amylase on starch, pepsin on proteins and lipase on fats

(Among SEC- students need to opt any Two from all 3 optional subjects in V Semester)

SEC-I CULINARY SCIENCE - PRINCIPLES & TECHNIQUES (32Hrs) 2+0+0=2Credits/week 2+0+0=2 Hrs/week

UNIT 1: Introduction to cookery, Culinary history, aims and objectives of cooking

UNIT 2: Food ingredients and their nutritional value - Bulk/staple foods, (cereals, legumes, fruits and vegetables, eggs, fish and marine foods, milk and milk products) fats and oils, spices, flavoring agents, additives, beverages

UNIT 3: Principles and Methods of cooking - Pre-processing of foods, cooking, roasting, frying, grilling, baking, boiling, microwaving, solar, infra-red cooking

UNIT 4: Role of food components - using specific examples for different types of foods such as Cereal and legume based dishes. Preparation of gravies and curries. Spices and flavoring ingredients. Baked products, Egg cookery, meat and fish Indian sweets and snacks Preserved products.

SEC-II: 2 NEUTRACEUTICALS AND HEALTH FOODS (32Hrs) 2+0+0=2Credits/Week 2+0+0=2Hrs/Week

UNIT1: Nutraceuticals:

A. Definition, Classification, food and non food sources, mechanism of action. Role of omega-3, fatty acids, carotenoids, dietary fiber, phytoestrogens; glucosinates; organo-sulphur compounds as neutraceuticals.

B. Use of neutraceuticals in traditional health sciences. Their role in preventing /controlling diseases.

UNIT 2: Prebiotics and probiotics:

Usefulness of probiotics and prebiotics in gastro-intestinal health and other benefits. Beneficiary microbes; prebiotic ingredients in foods; types of prebiotics and their effects on gut microbes.

UNIT 3: Functional foods:

Definition, development of functional foods, benefits and sources of functional foods in Indian diet. Effects of processing conditions and storage; Development of biomarkers to indicate efficacy of functional ingredients; Research frontiers in functional foods.

UNIT 4: Development of nutraceutical and functional foods:

Standards for health claims. Process of developing - preclinical & clinical studies, Marketing and Regulatory issues, Regulatory bodies in India.

VI SEMESTER

(Among DSE- students need to opt One paper in VI Semester) DSE –III FOOD PRODUCT DEVELOPMENT (64Hrs) 4+0+2 = 6 Credits (4+0+4 - 8Hrs/

(4+0+4 = 8Hrs/Week)

UNIT 1:

A. Food needs and consumer preferences

Needs and types of foods consumption trends. Economic, Psychological, Anthropological and Sociological dimensions of food consumption.

B. Trends in social change and its role in diet pattern

Consumer research and the market. Identifying the need for new products

UNIT 2:

A. Designing new products

Using the need based perspective and applications in various situations. The R & D process.

B. Developing standard products

Types of products and logistics. Processing- primary and secondary, various food ingredients used, use of food additives.

UNIT 3: A. Chemical and Physical properties of foods- Shelf life studies of products.

B. Packaging –suitability, development of the package, management Design and package graphics, labeling, research and testing.

UNIT 4: A. Storage and Transportation

Types of storage, Types and mode of transportation, optimization of transport taking into account the type of product, distance, storage facilities.

B. Food Safety and regulatory aspects, sanitation and waste disposal.

PRACTICALS

DSE –V FOOD PRODUCT DEVELOPMENT (64Hrs)

4 Hrs/week

1. Need for the development of new products - market survey (Listing variety of possible food products, Establishing selection criteria and target group. Selecting a food product for development).

2. Planning for the food product to be developed- Drawing up a working plan and time schedule: Processing steps, ingredients required, equipment required, standardization and preparation; conducting sensory evaluation, and shelf life studies.

3. Packaging of the food products and labeling (Collection from the markets).

6. Visits to commercial food manufacturing unit/ R&D Units, where food products are developed and tested.

DSE- IV DIET THERAPY (64Hrs)

4+0+2=6Credits/Week 4+0+4=8Hours/Week

UNIT 1: A. Objectives of diet Therapy: -

Definition of dietetics & clinical nutrition. Role of dietitian in hospital & community, importance & mode of dietary counseling.

B. Planning of hospital Diets: -

a). Rationale for modifications of nutrition: Protein, calories, sodium, fat, fiber and texture : Soft & fluid diets, nutrition in surgical conditions & burns,.

b). Special feeding methods: - enteral & parenteral feeding

Unit 2. Diet in the diseases of the gastro intestinal tract:

Etiology, symptoms, and diagnostic tests. Treatment and dietary modification:

- A. Gastritis, peptic ulcer, Diarrhea and constipation, Celiac disease, malabsorption syndrome.
- B. Liver diseases– Hepatitis, Cirrhosis, Hepatic coma. Role of alcohol in Liver disease– Cholecystitis and cholelithiasis, Food intoxication and infection (in brief)

UNIT 3: Diet in metabolic disorders

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. Hypo and hyperthyroidism-causes, symptoms and dietary management.

c. Diet in fevers and infection, Dengue, H1N1, Cancer, AIDS

Unit- 4 A. Diet in Kidney diseases: Basic renal function, etiology, symptoms, diagnostic tests, and dietary treatment of:

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.

B. **Diseases of the Cardio-vascular system:** Clinical, symptoms, etiology, and diet management during:

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.

C. Diet in burns and surgical conditions.

PRACTICALS

DIET THERAPY (64Hrs)

1. Planning and preparation of special diets:

a). High and low Protein, calories, sodium, fat, b). Soft & fluid diets. C). Bland diet for peptic ulcer. (Metabolic disease, Kidney disease and Cardiovascular disease)

2. Planning and preparation of diets for:

a). Viral hepatitis and cirrhosis of the liver. b). Diarrhea and constipation, Celiac disease, malabsorption syndrome.

3. Case study and diet history of diseases (Collection and presentation).

4Hrs/Week

(Among SEC- students need to opt any Two from all 3 optional subjects in VI Semester)

SEC-III NUTRITION AND FITNESS (32Hrs) 2+0+0=2Credits/Week 2+0+0=2Hours/Week

UNIT 1: Understanding Fitness: Definition of fitness, health and related terms, Assessment of fitness, Approaches for keeping fit.

UNIT 2: Importance of nutrition in Fitness: Role of nutrition in fitness, Nutritional guidelines for health and fitness, Nutritional supplements.

UNIT 3: Importance of Physical activity : Importance and benefits of physical activity, Types of Physical Activity – frequency, intensity, time with examples. Physical Activity Guidelines and physical activity pyramid.

UNIT 4: Weight Management: Assessment, etiology, health complications of overweight and obesity, Principles of planning weight reducing diets, Diet and exercise for weight management, Food Fad diets.

SEC-IV ENTREPRENEURSHIP(32Hrs)

2+0+0=2Credits/Week 2+0+0=3Hours/Week

UNIT 1: Importance of Entrepreneurship and its relevance in career growth. Entrepreneur, entrepreneurship and enterprise, Types of enterprise, Creativity, innovation and Problem solving.

UNIT 2: A. Business Plan – importance, Content, Preparing a business plan. Business Communication – Oral and written communication, improvement exercises.
 B. Books of accounts- Importance of accounting assessment, Different books, Accounting stationary, Operating mechanism. Financial Statements – Importance and interpret action, Profit and loss account, Balance Sheet, Cash- flow and fund flow.

UNIT 3: A. Small scale industry sector and its role in economic Development.

Planning a small scale industry: Identification and selection of business.

B. **Supporting Entrepreneurship:** Schemes and assistance of Support agencies – banks, SFC, IDBI, KSFC, KSSIDC, Small scale trades, Rozgar Yojana, Self-employment programme for woman etc..

C. Management of Working Capital – Concept of working capital. Factors to be controlled, Tools and techniques.

UNIT 4:

A. Marketing Management- Marketing for small business, Sales promotion – Strategies, tools and techniques, pricing policy; **Export marketing** – Understanding international business environment, Do's and don'ts for exports.

B. Legal implication – Income tax, Sales, excise, Labor laws, factory act, etc.

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