### B.Sc. HOME SCIENCE – DIETETICS – 3RD YEAR

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**NOTE:**

1. *Seminar*- Presentation on recent topics related to the subject
2. **The marks are totally internal. The seminar will be judged/evaluated by a panel of three staff members of the related department and the average score will be considered as final score.
UNIT – I

1. Carbohydrates:
   • Definition, classification, structure and properties
   • Monosaccharide – glucose, fructose, galactose
   • Disaccharides – maltose, lactose, sucrose
   • Polysaccharides – Dextrin, starch, glycogen

2. Proteins:
   • Definition, classification, structure and properties
   • Amino acids, essential and non-essential amino acids

3. Lipids:
   • Definition, classification, types and properties
   • Fatty acids
   • Fats – composition, acid Value, iodine value and saponification value
   • Classification and structure of phospholipids, lipoproteins – types, composition, role and significance in disease.

UNIT – II

4. Intermediary metabolism:
   • Carbohydrates – glycolysis, gluconeogenesis, glycogenesis, glycogenolysis, blood sugar regulation
   • Proteins – general reactions of amino acid metabolism, urea cycle
   • Lipids – oxidation and biosynthesis of fatty acids.
   • Ketone bodies, ketosis, fatty liver

5. Biological oxidation:
• Electron transport chain.
• Introduction to genetic control of metabolism – nucleic acids, composition, structure, replication, transcription, genetic code, translation

UNIT – III

6. Enzymes:
• Definition
• Types and classification of enzymes
• Specificity of enzymes
• Coenzymes
• Isoenzymes
• Factors affecting enzyme catalysis and enzyme inhibition

7. Fluid, electrolyte and acid-base balance:
• Molecular aspects of transport – Passive diffusion, active transport

UNIT – IV

8. Vitamins:
• Chemistry & biochemical role of fat soluble vitamins A, D, K & E.
• Water soluble vitamins – B1, B2, B6, niacin and C

9. Minerals:
• Macro minerals
• Micro minerals

10. Hormones:
• Biological role of – pituitary, adrenal cortex and medulla, thyroid, parathyroid, pancreas

RECOMMENDED READINGS:
• West ES, Todd WR, Mason HS and Van Bruggen JT (1990): Text book of biochemistry
• Champe PC and Harvey RA (2008): Lippincott’s illustrated reviews – Biochemistry.
• Varley H, Gowenlock AH and Bell M (1980): Practical and clinical chemistry.
1. Carbohydrates:
   • Reactions of mono, di and polysaccharides and their identification in mixtures
   • 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 fats and oils

3. Proteins:
   • Reactions of amino acids and their identification in mixtures

4. Vitamins:
   • Estimation of ascorbic acid content of foods by titrimetric / colorimetric method.

5. Minerals:
   • Estimation of calcium in calcium carbonate by EDTA titrimetric method
   • Estimation of phosphorus by colorimetric method

6. Enzymes:
   • Effect of pH and temperature on enzyme activity – amylase on starch / pepsin on proteins / lipase on fats (Demonstration only)
Objectives:

1. To orient the students with all the important methodologies applied in nutritional assessment and surveillance of human groups.
2. To develop specific skills to apply the most widely used methods.

Instructions to the paper setter:

1. Each theory paper will be of three hours duration.
2. Questions paper will have four sections.
3. A total of nine questions comprising of two questions from each section and one compulsory question of short answer type covering the whole syllabus will be set.
4. All questions may carry equal marks unless specified.
5. Students will be expected to attempt one question from each section and the compulsory question.

UNIT - I

1. Concept of community nutrition and Public Health Nutrition:
   • Nutritional Status & Surveillance- Meaning, objective and importance
   • Socioeconomic and culture

2. Protein Energy Malnutrition:
   • Causes
   • Measures to overcome malnutrition

3. Food processing techniques for improvement of nutritional quality:
   • Germination
   • Fermentation
   • Enrichment
   • Novel Foods
   • Parboiling
   • Supplementation
   • Fortification

UNIT - II

4. Nutrition education:
   • Objectives and scope
   • Individual and group methods for imparting nutrition education.

5. Nutrition and Infection
UNIT- III

6. Causes prevention and control of:
   • Vitamin A deficiency
   • Anemia
   • Iodine deficiency disorders

7. Assessment of nutritional status of an individual and group
   • Nutritional Anthropometry
   • Biochemical Tests
   • Clinical Signs

UNIT- IV

8. Dietary Surveys:
   • Need and Importance
   • Methods of dietary survey

9. Secondary sources of community health data and vital statistics

RECOMMENDED READINGS:

1. Planning and preparation of low cost nutritious recipes for various age groups: preschoolers, adolescents, pregnant and lactating women.
   - High Protein
   - High Calorie
   - Vitamin A rich
   - Iron rich

2. Planning and preparation of low cost nutritious recipes for nutrition programs like mid day meal, programme as per GOI guidelines.
INSTITUTIONAL FOOD SERVICE AND QUALITY MANAGEMENT
(THEORY)

Total Marks: 75
Paper: 65
Credit hours: 3/week
Internal Assessment: 10

Objectives:

1. To develop a knowledge base in key areas of institutional food management.
2. To impart necessary expertise to run a food service unit.
3. To provide practical level experience in managing food service management.
4. To critically evaluate the functioning of food service units.

Instructions to the paper setter:

1. Each theory paper will be of three hours duration.
2. Questions paper will have four sections.
3. A total of nine questions comprising of two questions from each section and one compulsory question of short answer type covering the whole syllabus will be set.
4. All questions may carry equal marks unless specified.
5. Students will be expected to attempt one question from each section and the compulsory question.

UNIT-I

1. Types of institutional food service operations:
   - Commercial
   - Non commercial

2. Meal planning in institutions:
   - Basic factors in institutional meal planning
   - Menu types and service
   - Portion control and maintenance of standard serving

3. Quantity food production:
   - Methods and techniques
   - Criteria of evaluating food quality
   - Food cost
   - Use of leftover foods.

UNIT-II

4. Organization:
   - Theories of organization
   - Different types of organization
5. Management:
   • Definition and functions
   • Tools of management – Organization chart, jobs analysis, job specification, job evaluation and work sheet.

UNIT-III

6. Personnel Management:
   • Types of personnel required
   • Personnel relationship
   • Methods of recruitment
   • Welfare provisions for employees – health, safety, recreation, meals. Labor and food laws.

7. Principles of resource management:
   • Factors affecting cost control
   • Cost concepts, types, and elements
   • Importance of cost control
   • Methods of purchasing and pricing
   • Requisition and inventory

UNIT-IV

8. Physical plant:
   • Location
   • Floor plans
   • Space
   • Kitchen units
   • Storage units
   • Serving units
   • Dish washing

9. Equipment :
   • Types of equipment
   • Factors affecting choice of equipments
   • Operation and care.

RECOMMENDED READINGS:

1. Planning and quantity cooking for different low and high income groups and occasions:
   - Lunch party
   - Birthday party
   - Working lunch
   - Low income group
   - Middle income group
   - High income group

2. Visits to hospitals, hostels, hotels, cafeterias and catering institutions.

3. Project reports on visits to hospitals, hotels, institutional cafeterias, kitchen plans.
NUTRITIONAL MANAGEMENT IN HEALTH AND DISEASE
(Theory)
(Common to Composite and Dietetics)

Total Marks: 75
Paper: 65
Internal assessment: 10

Credit hours: 3 /week

Instructions to the paper setter:

1. Each theory paper will be of three hours duration.
2. Questions paper will have four sections.
3. A total of nine questions comprising of two questions from each section and one compulsory question of short answer type covering the whole syllabus will be set.
4. All questions may carry equal marks unless specified.
5. Students will be expected to attempt one question from each section and the compulsory question.

OBJECTIVES:
This course should enable the students to –
1. Know the principles of diet therapy.
2. Understand the modifications of normal diet for therapeutic purposes.
3. Understand the role of the dietician.

UNIT - I

1. Team approach to health care:
   • Role of doctor, dietitians and paramedical staff with regards to assessment of patients needs.

2. Energy modifications and nutritional care for weight management:
   • Overweight and obesity: Etiological factors, prevention, low energy diets, behavioral and dietary management.
   • Underweight: Etiology, high energy diets.

UNIT - II

3. Etiology, symptoms and management of upper GI tract diseases
   • Gastric and duodenal ulcers
   • Flatulence
   • Hyperacidity and reflux.

4. Etiology, symptoms and management of intestinal diseases:
   • Steatorrhoea
   • Diverticular disease
   • Ulcerative colitis
   • Irritable bowel syndrome
   • Hemorrhoids
UNIT - III

5. Etiology, symptoms and management of liver diseases:
   - Infective hepatitis
   - Cirrhosis

6. Etiology, symptoms and management of diabetes mellitus:
   - Classification and types
   - Glycemic index
   - Glucose tolerance test

UNIT - IV

7. Etiology, symptoms and management of cardiovascular diseases:
   - Atherosclerosis
   - Hypertension
   - Coronary heart disease.

8. Etiology, symptoms and management of:
   - Glomerulonephritis

RECOMMENDED READINGS:

- Modern Nutrition in Health and Disease, Maurice E Shills, 9th edition, Lippincott Williams and Wilkins, USA.
1. Planning and calculation of nutritive content and preparation of diets for the following conditions:
   - Overweight and Obesity
   - Ulcers
   - Liver diseases: Infective Hepatitis
   - Diabetes mellitus- Type II
   - Hypertension and atherosclerosis
   - Glomerulonephritis

2. Visit to a Dietetics Department in a local hospital for observing team approach to nutritional care of patients.
Objectives:

1. Understand the basic concepts of food science and its applications in processing of food.
2. Learn about the quality parameters of various foods.
3. Gain practical knowledge about food components and their role in cooking.

Instructions to the Paper Setter:

1. Each theory paper will be of three hours duration.
2. Question paper will have four sections/units. Paper setter will set a total of nine questions comprising of two questions from each section and one compulsory question of short answer type covering the whole syllabus.
3. Student will attempt one question from each unit and the compulsory question (Total of five questions)
4. All questions may carry equal marks, unless specified.

UNIT – I

1. Introduction to food science :
   - Definition, importance and applications
   - Basic terminology used in food science*

2. Food acceptability:
   - Factors affecting food acceptability
   - Subjective and objective methods of evaluation
   - Tests for sensory evaluation

UNIT – II

3. Structure, selection, storage, uses in cooking of the following :
   - Milk and milk products
   - Meat products – meat, poultry, eggs and fish
   - Cereals and cereal products

4. Structure, selection, storage, uses in cooking of the following :
   - Fruits and vegetables
   - Nuts and oilseeds
   - Beverages – tea, coffee
UNIT – III

5. Structure, selection, storage, uses in cooking of the following:
   • Legumes and pulses
   • Fats and oils
   • Sugars
   • Spices and herbs

6. Role of colloidal chemistry in cooking:
   • Definition of colloidal systems
   • Hydrophilic and Hydrophobic colloids
   • Gel formation and emulsions.

UNIT – IV

7. Food adulteration:
   • Basic concept of adulteration
   • Types of adulterants
   • Common methods for detecting adulterants

8. Food quality assurance:
   • National and international food laws – FSSAI, Codex and ISO
   • Quality assurance procedures – GMP, GHP, HACCP

RECOMMENDED READINGS:

4. Low, Bells; Experimental Cookery.
5. Sweetman-M.D; Food Selection and Preparation.
8. Paul, C., Paulin; Food Science and Application.
*ANNEXURE :  
1. Emulsion  
2. Gel  
3. Augratin  
4. Leavening  
5. Marbling  
6. Baste  
7. Marinate  
8. Sol  
9. Fortification  
10. Germination
1. Effect of heat on preparation of following food groups -
   - Milk and milk products - effect of pH and heating on milk, preparation of paneer
   - Egg - foaming in egg whites, preparation of emulsion like mayonnaise, effect of heating on egg proteins
   - Cereal and cereal products - gluten quality and quantity in preparation of cake, biscuits, bread, gelatinization of starches.
   - Fat and oils - smoking point of different fats and oils
   - Beverages - preparation of tea, coffee, shakes
   - Fruits and vegetables - demonstration of browning in fruits and vegetables, effect of pH and heat on fruits and vegetables
   - Legumes and pulses - demonstration of sprouting in pulses
   - Sugars - effect of heat on solubility of sugars, sugar cookery in terms of cold water and thread tests, caramelisation of sugars and crystallization through preparation of brittles, fondue, shakarpara

2. Food adulteration - common tests to detect food adulterants (coffee, ghee, turmeric, honey, black pepper corns)
GENERAL FOODS

(THEORY)

Total Marks: 75
Paper: 65
Internal assessment: 10
Credit hours: 3 /week

Objectives:

1. To enable the students to understand the basic concepts of nutrition
2. To expose the students to varied fields in nutrition

Instructions to the paper setter:

1. Each theory paper will be of three hours duration.
2. Questions paper will have four sections.
3. A total of nine questions comprising of two questions from each section and one compulsory question
   of short answer type covering the whole syllabus will be set.
4. All questions may carry equal marks unless specified.
5. Students will be expected to attempt one question from each section and the compulsory question.

UNIT - I

1. Food Exchange List:
   • Introduction
   • Use and importance in meal planning

2. Planning of basic diets using the food exchange list

UNIT - II

3. Food contaminants:
   • Microbial
   • Chemical
   • Natural

4. Anti nutritional factors found in food:
   • Trypsin inhibitors
   • Avidin
   • Hemagglutinns
   • Phytates and oxalates.

UNIT – III

5. Food allergy and intolerance:
   • Concept of food allergy
   • Gluten intolerance
   • Lactose intolerance
6. Eating disorders: causes, symptoms and management of:
   - Anorexia
   - Bulimia
   - Binge Eating Disorders

UNIT - IV

7. Nutrition in disaster management:
   - Famines
   - Floods
   - Emergency situations: war, earthquake

8. Nutrition in sports:
   - High intensity sports activity
   - Low intensity sports activity

RECOMMENDED READINGS:

- WHO Technical Reports Series for different Nutrients.
B.Sc.-III year (Common to all streams)
ECONOMICS AND ENTREPRENEURSHIP DEVELOPMENT
(THEORY)

Credit hours: 2/week  M. Marks : 50
Paper: 3hrs  Paper : 45
Int. Ass. : 05

Objectives:
1. To prepare the platform where the students view entrepreneurship and self-employment as a desirable and feasible career option.
2. Stimulating the potential to develop entrepreneurial orientation through innovation and creativity.
3. To orient the students with basic principles involved in starting and managing a new enterprise.

Instruction for paper setters:
1. Each theory paper will be of three hours duration.
2. Questions paper will have four sections.
3. A total of nine questions comprising of two questions from each unit and one compulsory questions of short answer type covering the whole syllabus will be set.
4. All questions may carry equal marks unless specified.
5. Students will be expected to attempt one question from each unit and the compulsory question.

Unit- I

1. Entrepreneurial economics:
   a) Need and importance
   b) Entrepreneurship and role in economic development

2. Entrepreneur and Enterprise:
   a) Entrepreneurial traits and types
   b) Entrepreneurial competencies.

3. Women entrepreneurs:
   a) Characteristics
   b) Role and challenges faced during creation and enterprise management

Unit-II

4. Business Idea/Plan:
   a) Pitching a business idea and its formulation.
5. Project Formulation:
   a) A brief introduction.
   b) Finance proposal and sources.

6. Intellectual Property rights (Creation-Protection-Encashing)

Unit-III

7. Small business enterprise management:
   a) Problems of small enterprises in India.
   b) Non Profit Institutions in support of small business development.

8. Business Environment:
   a) Factors affecting business environment and profitability of business

Unit-IV

9. Business marketing:
   a) Marketing strategies-packaging, advertising & publicity, e-marketing
   b) Four Ps of marketing-Product, Price, Place and Promotion.

10. Conducting a SWOT analysis of enterprise.

Recommended Readings:

6. SIDBI Report on Small Scale Industries Sector (Latest Editions)
B.Sc.-III year (Common to all streams)
ECONOMICS AND ENTREPRENEURSHIP DEVELOPMENT
(PRACTICAL)

Credit hours: 2/week M. Marks : 50
Paper: 3hrs Paper : 45
Int. Ass. : 05

Objectives:
1. To prepare the platform where the students view entrepreneurship and self-employment
   as a desirable and feasible career option.
2. Stimulating the potential to develop entrepreneurial orientation through innovation
   and creativity
3. To orient the students with basic principles involved in starting and managing a new enterprise

Instruction for paper setters:
1. Each practical paper will be of three hours duration.
2. Questions paper should cover the entire syllabus.
3. The file work and viva will be of 5 marks each (Total = 10 marks)

Contents:
1. Preparation of project report for small enterprises/cottage industries. (The students will
   be advised to develop a structured instrument (questionnaire) for conducting first
   hand survey of the various aspects of respective entrepreneurs/enterprise, conducting
   the SWOT analysis and suggesting feasible measures for policy implementation).
2. Assignments on opportunity scouting and idea generation: role of creativity & innovation in business research.
3. Developing a Business Plan for Micro enterprises on any one of the following:
   a) Cafeteria/Diet clinic
   b) Nursery school/Day care
   c) Boutiques
   d) Interior Design studios.
B.Sc. Home Science 3rd year

EXTENSION EDUCATION (Theory)
(Common to all streams)

Credit hours: 2 /week       Total Marks : 50
Exam Time:     3 hours       Paper (Theory): 45
                             Int. Assessment: 05

Instructions for Paper Setter:

1. Each theory paper will be of three hours duration.
2. Question paper will have four sections.
3. A total of nine questions comprising of two questions from each unit, and one compulsory question of short answer type covering the whole syllabus will be set.
4. All questions may carry equal marks unless specified.
5. Students will be expected to attempt one question from each unit and the compulsory question.

Objectives:

1. To understand the concept of extension and its relevance for self & national development.
2. To appreciate the role of Home Science extension in community development.
3. To create awareness about rural development and various programmes and agencies involved in it.
4. To sensitize students towards various methods, preparation and selection of suitable materials for effective communication.

Unit-I

INTRODUCTION TO EXTENSION EDUCATION

- Concept, principles, philosophy of extension
- Extension Education process
- Qualities of extension workers
- Home Science Extension as a discipline and its contribution towards development.
Unit-II

RURAL AND COMMUNITY DEVELOPMENT

- Definition of rural and community development
- Origin of community development
- Introduction to Panchayati Raj and Democratic Decentralization
- Rural Development Programmes in India – Integrated Child Development Services (ICDS), etc.

Unit-III

EXTENSION TEACHING METHODS AND AIDS

- Concept and steps in extension teaching
- Classification of extension teaching methods according to form and use
- Classification of Audiovisual aids
- Introduction of various audio visual aids

Unit-IV

EXTENSION PROGRAMME

- Concept of Extension Programme Planning
- Factors affecting selection and use of extension teaching methods and aids in extension programme planning.
- Steps in Extension Programme Planning
B.Sc. Home Science 3rd year
EXTENSION EDUCATION
Practical
(Common to all streams)

Exam time: 3 hrs                                            Total Marks: 50
Credit hours – 2 / week                                    Paper :45
Internal Assessment :05

Instructions for Paper Setter:

1. Each practical paper will be of 3 hours duration.
2. The question paper should cover the entire syllabus.
3. The file work and viva voice will be of 5 marks each (Total = 10 marks)

Objectives:

1. To cradles the seed of social awareness in the students and make them understand their own worth in the society.
2. To develop skills in the use of participatory approaches in program planning and evaluation.
3. To fulfills the social responsibility of the students by giving their knowledge and service to the people in need.

Contents:

1. Preparation, presentation and evaluation of any one visual aid (poster, chart, etc.).
2. Preparation, presentation and evaluation of any one A-V aid (puppet show, power point presentation, etc.).
3. Survey of a selected community to identify their felt and unfelt needs.
4. Planning, organization, implementation and evaluation of a needbased extension programme for the selected community in relation to anyone of the following:
   • Literacy
   • Income Generation
   • Health
   • Social Evils.
REFERENCES


