

Food and Nutrition

Grade: XII

Teaching hours : 150 hrs
Theory : 20 hrs
Practical : 30 hrs

1. Introduction:

Food is the first and the foremost among the six basic human needs. Food is consumed in order to provide nourishment to the body for its proper functioning. Improper food intake results in various forms of health hazards leading to poor physical and mental growth and development. Hence the knowledge of this subject is essential to all human beings specifically to those students who plan to study medical sciences, food technology, hotel management, dietetics and nursing for their graduation because this course provides basic knowledge of foods as well as nutrition in relation to health and disease, food science and technology and food microbiology.

The entire course is divided into five units – four units in theory and one unit in practical. Each unit carries 20 marks and 30 teaching hours.

2. General Objective:

The general objectives of this course are to enable the students to understand the concept and to acquire knowledge of basic food and nutrition, nutritive value of food and diet planning, nutrition health and diseased conceptions and nutritional improvement by food preservations and processing.

3. Specific Objectives:

After completing this course, the students will be able to –

- write the functions of three basic food groups with examples;
- classify nutrients with functions and food sources;
- prescribe RDA for children and adolescent boys and girls;
- calculate nutritive value of commonly used food items;
- explain various forms of malnutrition and its situation in Nepal;
- describe the dietary management for adolescent person on the basis of their BMI and also for diabetic patient;
- explain different methods of food preservation and processing;
- identify the cause of food spoilage and food poisoning;
- conduct market survey of various food items and calculate their nutritive value,
- prepare proper food handling guidelines for local community;
- write about various forms of malnutrition and its situation in Nepalese context;
- differentiate between underweight, overweight and obese adolescent according to Body Mass Index;
- explain dietary management for diabetic patient;
- discuss the relationship between nutrition and worm infestation;
- describe diarrhea infection and oral dehydration therapy;
- write the importance of balanced diet;
- explain about RDA for children and adolescent boys and girls;
- describe the factors affecting meal planning;
- write about the adolescent person's food habit and suggest for its nutritional improvement;

- identify the low cost nutritious traditional food items;
- tabulate the nutritive value of commonly used food items;
- define the processing and preservation of food;
- introduce the importance of processing and preservation of food;
- describe the types of preservation;
- explain the methods of food preservation;
- write the causes of food spoilage;
- mention the causes of food poisoning and food infection ;
- explain the methods of food processing;
- calculate BMI (Body Mass Index) for adolescent boys and girls;
- prepare chart on three basic food groups by introducing locally available food sources;
- conduct market survey of traditional food items and prepare a chart with their nutrient contents and
- carry out a study on local practices of food handling and give proper food handling guidelines to the people.

4. **Course Content**

Unit I: Basics of Foods & Nutrition

Teaching hours-30

- a) Introduction to Foods and Nutrition – Teaching hours 10
- i. Definition of Terminologies in Foods and Nutrition – (food, nutrition, nutrients energy, calorie, anabolism, catabolism, metabolism, basal – metabolism, body mass index (BMI), recommended dietary allowances (RDA), mal – nutrition, under nutrition, over nutrition, stunting, wasting, under weight, over weight, obese, obesity, micro nutrients, macro nutrients.
 - ii. Functions of food and nutrition.
 - iii. Functions of nutrients in human body.
- b) Three Basic Food Groups Teaching hours 12
- i. Carbohydrate and fat rich foods – cereals, roots and tubers, fats and oils, nuts and oil seeds.
 - ii. Protein rich foods – legumes and pulses, milk and milk products, meat, fish and poultry.
 - iii. Vitamins and Minerals rich foods – vegetables and fruits.
- c) Types of nutrients and its classification. Teaching hours 8
- i. Macro nutrients – carbohydrate, protein, fat, calcium and phosphorus.
Micro nutrients – Iron, iodine, sodium, potassium and vitamins.
Energy giving food – (carbohydrates, fats and oils) – introduction, functions and food sources
 - ii. Body building and maintaining food –(Protein) – introduction, functions and food sources
 - iii. Body protecting and regulating foods – (vitamins and minerals) – introduction, functions and food sources
 - iv. Nutritional composition of human body (as percentage of protein, carbohydrate, fats, vitamins, minerals and water).

5. **Teaching Methodology**

Lecture, discussion, demonstration of charts, posters for three basic food groups, demonstration of actual food materials in three basic food groups./ observation/field visits/ group work.

6. **Teaching Materials**

Charts, posters and actual food materials of related topics.

7. **Evaluation Technique**

Question answer in the class, home assignment, class test, unit test in the class after completion of the unit.

UNIT II: Nutritive Value of food and diet planning

Teaching hours 30

Course Content:

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| a) Balanced diet – introduction and importance | 4 |
| b) Recommended Dietary Allowances (RDA) – introduction, RDA for children (1-5 years) and adolescent boys and girls (15-18 yrs) | 6 |
| c) Food habit of adolescents and nutritional consideration – ways and means to improve nutritional quality of adolescent’s diet. | 4 |
| d) Meal planning – introduction, factors affecting meal planning, meal planning for children (1-5yrs) and adolescents (15-18 yrs). | 8 |
| e) Low cost, nutritious traditional food items and their nutritive value. | 4 |
| f) Nutritive value of commonly used food items (carbohydrate, protein, fat, calorie, vitamin A, vitamin C, iron, calcium, phosphorus) | 4 |

Teaching Methodology:

Lecture using actual traditional food items, discussion for active participation of the students, demonstration by using charts wherever possible and traditional food items.

Teaching Materials:

- Charts, posters of balanced diet and RDA
- Pictures of traditional food items or actual food items.
- Book or chart consisting of nutritive value of commonly used food items.

Evaluation technique:

Class test, home assignment, group interactions.

UNIT III: Nutrition in health and diseased conditions

Teaching hours – 30

Course Content:

- a) Malnutrition – introduction, types – under nutrition, over nutrition, causes and situation in Nepalese Context. Teaching hours : 4
- b) Nutritional deficiency diseases – causes and dietary treatment. Teaching hours :10
 - i. Protein energy malnutrition – kwashiorkor and marines.

- ii. Vitamin A deficiency – Night blindness and Exophthalmia
- iii. Iron deficiency – anemia
- iv. Iodine deficiency – goiter
- c) Body Mass Index (BMI) – introduction, cut off point in BMI, dietary management for underweight, overweight and obese adolescent. Teaching hours 4
- d) Nutrition for diabetic person – introduction and dietary management. Teaching hours : 6
- e) Nutrition and worm infestation. Teaching hours: 6
 - i. Worm infestation – introduction and causes
 - ii. Relationship between nutrition and worm infestation.
 - iii. Ways to control worm infestation by sing de worming tablets.
 - iv. Diarrhea infection and principle of oral dehydration therapy.

Teaching Methodology:

Lecture, Interactions between teachers and students, Demonstration by using charts wherever possible.

Teaching Materials:

Posters of deficiency diseases, Charts of protocols of de-worming tablets, ORS.

Evaluation Technique:

Class test, home assignment and group interactions.

UNIT IV:

Nutritional improvement by food preservation and processing

Teaching hours : 30

Course Contents:

- a) Food preservation – Teaching hours : 10
 - Introduction, types, methods –
 - traditional methods - sun drying, smoking, by the use of spices, oil, sugar and salt.
 - modern methods – use of high temperature – (solar drying, electric drying),
 - use of low temperature – (Refrigeration) and
 - canning and bottling.
- b) Food Spoilage - Teaching hours : 6
 - Causes, types of spoilage- microbial spoilage, autolysis
 - i) Spoilage of fresh foods
 - ii) Selection of fresh foods
- c) Food poisoning and food borne infection: Teaching hours : 7
 - i) Food poisoning – introduction, causes and types
 - ii) Food borne infection – Introduction, causes and types.
 - iii) Food hygiene and sanitary handling of food.
- d) Food processing to improve nutritional quality - Teaching hours : 7
 - Fermentation, germination, fortification (in industrial scale)
 - and combination- introduction, processing methods and increase in nutrient content with examples.

Teaching Methodology:

Lecture, Group discussion, Home assignment, Demonstration by the use of actual food items

Teaching materials:

Posters and charts

Evaluation Technique:

Class test, Question answer in the class and home assignment.

UNIT V
Practical

Teaching hours: 30

Course Contents:

- a) Calculation of BMI (Body Mass Index) for adolescent boys and girls (4 cases).
Teaching hours : 2
- b) Preparation of charts on three basic food groups with locally available food sources.
Teaching hours : 8
- c) Market survey of traditional food items and prepare a chart with nutritive value.
Teaching hours : 10
- d) Local practices of food handling and proper guidelines for food handling and report writing.
Teaching hours : 10

Teaching Methodology:

Lecture(orientation), Discussion, Demonstration, Chart preparation, Assignment on report writing.

Teaching Materials:

Chart papers and marker pens, sign pens, rulers, Posters/charts (ready made models) of three basic food groups.

Evaluation Techniques:

Class test, Evaluation of charts prepared by students, Evaluation of the report presented by students will be done by the subject teacher internally. No external examiner is required. No final examination will be required

Written Examination – 100

Theory – 80 marks

Practical – 20 marks

Pass marks - 35

8. References :

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12. Ramesh Kanta Adhikari and Miriam Krantz "Child Nutrition and Health." (2002)
13. Sharma, I. And Upreti, N. "Paustik Aahar Tatha Sishu Vikas". (1991)
14. Soundara Raj Stella, "A Text Book of Household Arts", Orient Longman Limited.
15. Walter W. Krueger, "Principles of Microbiology", W.B. Saunders Company
16. Wilson Eva D, Katherine H. Fisher, Mary E. Fugua " Principles of Nutrition"
