

7 **FOOD SCIENCE AND NUTRITION**

Perquisites: Food Sanitation and Safety

Credits: 3

Overview

This course will examine the scientific method and the chemical and physical changes that occur during preparation, processing and storage of food products. Basic principles of nutrition and micro-biology as it relates to chemical and physical changes to food will also be examined.

General Objectives

This course is designed to assist students to:

- 1 emphasize the importance of scientific knowledge to food preparation
- 2 recognize the role of food service providers in relation to customers' wants and needs
- 3 raise awareness of the relevant concerns regarding diets and healthy eating
- 4 select commodities, work out combinations and cookery methods that provide for specified dietary needs.

Learning Outcomes

Upon completion of the topic the learner will be able to:

- 1 discuss the basic concepts of nutrition and food science and their importance in food preparation and storage.
- 2 demonstrate proper procedures while preparing food for public consumption
- 3 distinguish between the facts and myths about nutrition as they relate to ethnicity, religion and health challenges
- 4 analyze the laws and their relationship to consumer protection
- 5 discuss the changes that occur to food products during production and storage.
- 6 prepare written reports on food quality using the principle method of food science.
- 7 execute scientifically sound experiments to evaluate ingredient functionality and changes that occur to food products during production and storage.

- 8 Prepare a selection of dishes suitable for persons requiring special diets such as vegetarians, vegans, diabetics, high cholesterol, salt free, lactose intolerant

Topics

1.0 Basic Anatomy and the Importance of Good Nutrition

Objectives

Upon completion of the topic the student will be able to:

- 1.1 define nutrients
- 1.2 outline functions of nutrients and identify their sources
- 1.3 define and discuss the term "nutrition" and its importance in the Culinary Arts
- 1.4 discuss the fundamentals of human structure and function
- 1.5 differentiate between nutrition and malnutrition
- 1.6 define human nutrition
- 1.7 discuss nutrition related diseases
- 1.8 discuss nutrition as it relates to vegetarians
- 1.9 discuss ethnic and religious challenges to nutrition
- 1.10 discuss what is meant by food allergens
- 1.11 discuss the effects of heat, oxidation, water, alkali on nutritional elements.

Content

- Principles of nutrition
- Human structure and function
- Challenges to human nutrition

2.0 Principles of Chemistry and Microbiology in the Preparation of Food

Objectives

Upon completion of the topic the student will be able to:

- 2.1 discuss the chemistry of food composition
- 2.2 discuss the function of fats, proteins and carbohydrates
- 2.3 identify enzymes, flavours, colours, vitamins and food additives
- 2.4 sample a variety of foods that include food additives

- 2.5 discuss food laws and regulations
- 2.6 state the basic local labeling requirements and nutritional labeling

Content

- The effects of cooking on a variety of foods
- The use of additives in food
- Legislation relating to food

3.0 Chemistry and Preservation of Foods

Objectives

Upon completion of the topic the student will be able to:

- 1.1 define food preservation
- 1.2 discuss the shelf life of food commodities and some beneficial/harmful events in the microbiology of foods
- 1.3 discuss alcoholic, acetic acid, yeast and lactic acid fermentation
- 1.4 define “food spoilage”
- 1.5 identify food-borne and waterborne pathogens
- 1.6 explain and describe microbial growth
- 1.7 discuss sensory evaluation of food commodities

Content

- Food spoilage
- Fermentation
- Food-borne and water-borne pathogens and microbial growth in foods

4.0 Principles of HACCP

Objective

Upon completion of the topic the student will be able to:

- 4.1 discuss practical application of HACCP.

Content

- The importance of HACCP
- The application of HACCP

5.0 Chemical and Physical Changes to Foods

Objective

Upon completion of the topic the student will be able to:

- 5.1 analyze the chemical and physical changes that occur in a variety of food commodities when processed:
 - Colour and texture of vegetables.
 - Wheat and egg products.
 - Starches and gelatin
 - Dairy products.
 - Enzyme proteins.
 - Meat proteins.
 - Fruit ripening.

Content

- Analysis of chemical and physical changes that occur in food commodities when processed

6.0 Preparation of Specialty Diets

Objectives

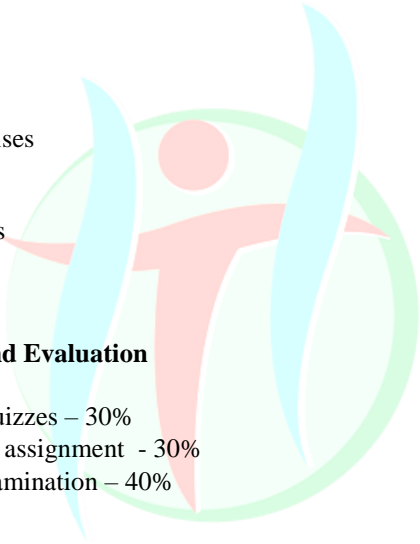
Upon completion of the topic the student will be able to:

- 6.1 identify the specific ingredients for each special diet
- 6.2 classify the specific ingredients for each special diet
- 6.3 discuss common food allergies
- 6.4 identify the different methods of cookery that will be encountered in the preparation of these special dishes
- 6.5 plan, prepare, cook and present meals consisting of a variety of dishes suitable for the following diets:
vegetarian, vegan, diabetic, low sugar, low fat, low sodium, gluten and lactose free

Content

- vegetarian cookery
- diabetic cookery
- low-cholesterol diets
- diet for persons who are hypertensive
- cookery for the lactose intolerant

Instruction Format



Lectures
Practical exercises
Visual aids
Discussions
Demonstrations
Labs

Assessment and Evaluation

- Two (2) quizzes – 30%
- One group assignment - 30%
- A final examination – 40%

Recommended Texts

The Theory of Hospitality and Catering, 2011, David Foskett and P Paskins; published by Hodder Education.

Nutrition Made Simple; Versada S. Campbell and Dinesh P. Sinha

Science of Food; John Wiley and Sons

Nutrition for Foodservice Culinary Professionals, 8th Edition 2013, K E Drummond & L M Brefere. Published by Wiley.

Nutrition your Life Science, 1st Edition 2012, J Turley & J Thompson; published by Cengage Learning

Resources

Nutrition for Food Service and Culinary Professionals, K E Drummond and L M Brefere; published by Wiley and Sons.

Introductory Foods; Bennion, Marion, Prentice Hall.

On Food and Cooking, Harold McGee.

Attendance

Students are encouraged to attend all class sessions as all information presented may not be covered in the required text. Participation of students is an integral component of the learning process.