

**CERTIFICATE COURSE IN FOOD
TECHNOLOGY**

2020-2021

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Name of the course: CERTIFICATE COURSE IN FOOD TECHNOLOGY

Duration: 90 Hours

Course timings: 1st & 3rd Saturday

Minimum eligibility for candidates: I & II B.Sc

(Natural Sciences students- CBZ, MCB/Z, CBBt, CEB/Z)

Course Fee: 4,000.00 (Rupees four thousand only)

No. of credits: 03

CERTIFICATE COURSE IN FOOD TECHNOLOGY

Total No. of Hours: 90 hours

Total credits: 03

Theory: 50 hours

Practical: 40 hours

Project/Assignment/Training:

SCOPE OF THE CERTIFICATE COURSE

Food has become a high-profit industry by reason of the scope it offers for value addition, particularly with the food processing industry getting recognized in India as a high-priority area.

In order to achieve the expected returns on investment through good quality and right value addition, application of technology has become imperative, leading to an unprecedented demand for scientists, technologists and other professionals who can manage the emerging challenges of the food processing industry effectively.

This role of professionals and trained personnel in the food industry as well as in the various R&D areas of food Science and technology is immense.

In simple words "There is huge requirement for Food Technology professionals in India and abroad".

The concept of processed foods has caught the imagination of consumers in recent years because of their enhanced convenience, variety, nutrition and taste. The challenge therefore lies in continuously developing new variations of food items, as well as new processes that will maximize its appeal and shelf-life, and minimize the use of chemicals and preservatives.

Food Science is the discipline in which biology, physical science, and engineering sciences are used to study the nature of foods, the causes of their deterioration, and the principles underlying food processing. Food Technology is the application of food science to the selection, preservation, processing, packaging, distribution and use of safe, wholesome and nutritious food.

The food processing industry covers a range of food products. These include the basic or primary foods such as wheat and rice products, sugar, oil and pulses and the processes for converting them into edible form and the processed foods such as biscuits and bakery products, confectionery, dairy products, breakfast foods, meat and fish products, fruit and vegetable products and all such items which are processed and packaged to enhance and prolong their edible life.

The swelling consumerism has seen the introduction of a range of new products like ready-to-eat snack foods, breakfast cereals, vegetable protein foods and so on. Different brands of the same item and attractive packaging vie for the consumers attention.

The Food technology is a branch of science in which the food science is applied in manufacturing and preservations of food products. The food technologists study the chemical, physical and microbiological makeup of the food.

OBJECTIVES OF THE CERTIFICATE COURSE

- ❖ To train students to actively participate in every facet of the country's growing food industry.
- ❖ To gain knowledge and understanding about food systems in the production, processing and consumption of food and an appreciation of their impact on society
- ❖ To have a knowledge and understanding about the nature of food and human nutrition and an appreciation of the importance of food to health
- ❖ To learn skills in researching, analyzing and communicating food issues, skills in experimenting with and preparing food by applying theoretical concepts and skills in designing, implementing and evaluating solutions to food situations.
- ❖ To develop entrepreneurial spirit among students for inspiring them to set up their own facilities.
- ❖ To spread awareness in the community about the Science of Technology of food processing for use in the household and cottage sector.
- ❖ To take up developmental works for new products and for improved formulations for traditional food products.
- ❖ To collaborate actively with industry for mutual benefits. To inculcate a spirit of social service in students by involving them in the activity.

SYLLABUS OF THE CERTIFICATE COURSE

(THEORY) 50 hours

UNIT-I INTRODUCTION TO FOOD TECHNOLOGY: 8 hours

1. History and development of food technology, evolution of cooking processes, fermentation processes and food preservation processes.
2. Physico-chemical properties of food- boiling point, evaporation, melting point, smoke point, surface tension, osmosis, humidity, freezing point and specific gravity and H-ion concentration.
3. Colloidal systems- Particle size and extent of dispersion, stability of colloids, properties of colloidal dispersion. Starch and protein colloids. Type of colloidal system in food- sol, gel, emulsion, foam.

UNIT-II COMPOSITION AND NUTRITIVE VALUE OF PLANT FOODS: 8 hours

1. Cereals- production, structure, composition and storage.
Novel foods: breakfast cereals, instant mixed foods, infant foods
2. Legumes- beans and peas
3. Beverages- nutritious and refreshing drinks-alcoholic and non-alcoholic.
4. Nuts and oil seeds- coconut, groundnut, soybean (extrusion), sesame, sunflower.
5. Spices and condiments- garlic, onion, olive oil and vinegar.

UNIT-III COMPOSITION AND NUTRITIVE VALUE OF ANIMAL FOODS: 8 hours

1. Milk and milk products- preservation of milk and production of fermented milk products (yoghurt, cheese and cultured butter milk)
2. Meat and meat products- preservation and curing of meat.
3. Egg and egg products- nutritive value, composition and preservation of egg.
4. Sea foods- preservation and use of brine.

UNIT-IV PRINCIPLES OF COOKING:**6 hours**

1. Thermal heating, Barbecue, Grilling, Steaming and Microwave. Cooking utensils and covering for microwave.
2. Factors influencing-standing time, volume, density, defrosting. Standing time before serving and stirring.
3. Arrangement of food.

UNIT-V FOOD ADDITIVES AND ADULTERATION:**6 hours**

1. Food additives, antioxidants, sequestrants, preservatives, nutrient supplement, emulsifiers, stabilizers and thickening agents, bleaching and maturing agent, sweeteners, humectants and anti-caking agents, coloring and flavoring substance
2. Food adulteration: Types of adulterants- intentional and incidental adulterants, methods of detection. Health hazards and risks.

UNIT-VI PRODUCTION OF NOVEL FOOD:**2 hours**

1. Mushroom cultivation-SCP, leaf protein concentrates.
2. Irradiated and radiated foods and food analogues.

UNIT-VII FOOD PACKAGING:**2 hours**

1. Package evolution- Functions, types and safety measures of packaging materials.
2. Packaging materials- aseptic and biodegradable methods.
3. Packaging of meat, poultry, fish, sea food, fruits, vegetables and milk

UNIT-VIII FOOD SAFETY, QUALITY AND EVALUATION: 10 hours

1. Evaluation of foods-physical (taste, volume, texture, viscosity) and chemical methods (pH, acidity, alkalinity, sugar concentration).
2. Principles of food contamination- sources of microbial contamination of foods.
3. Spoilage of foods- spoilage of fruits and vegetables, grains, milk and milk products, meat, poultry and sea foods.
4. Preservation of foods
 - a. physical methods: cold and heat treatment, ultra sound and microwave.
 - b. chemical methods: organic acids, sodium chloride, sulfites, nitrites.
 - c. antimicrobial compounds: lactoperoxidase system, lactoferrin, spices and their essential oils.
5. Factors affecting the growth of microbes- intrinsic and extrinsic factors.
6. Development and impact of rapid methods for the detection of food borne pathogens
 - a. AOAC
 - b. HACCP
 - c. FPO
 - d. FDA
 - e. ISO 9000 Certification

**SYLLABUS OF THE CERTIFICATE COURSE
(PRACTICAL) 40 hours**

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| 1. Study of instruments- pH meter, Refractometer, Viscometer, Lactometer, Alcoholometer, Microwave | 2 Units |
| 2. Identification of different foods | 1 Unit |
| 3. Microscopic observation of fungi from spoilt fruits and vegetables | 2 Units |
| 4. Measurement of foam in egg white | 1 Unit |
| 5. Antimicrobial activity of spices | 3 Units |
| 6. Microbial analysis of foods | 3 Units |
| 7. Production of milk-based beverages | 1 Unit |
| 8. Determination of quality of milk | 3Units |
| 9. Measurement of acidity in different foods-pH, TSS, Volatile acidity, Degre's brix. | 3 Units |
| 10. Preparation of fruit squash | 1 Unit |
| 11. Estimation of ascorbic acid in fruit juices | 1 Unit |
| 12. Alcohol production from jaggery | 1 Unit |
| 13. Preparation of mayonnaise as a stable emulsion | 1 Unit |
| 14. Preparation of peanut butter | 1 Unit |
| 15. Meal making- Preparation of chikki from oil seeds | 2 Units |
| 16. Preparation of wheat bran, popcorn. Germination and malt making | 3 Units |
| 17. Preparation of pickles | 1 Unit |
| 18. Mushroom cultivation | 1 Unit |
| 19. Food adulteration: Substance adulteration test for coffee, chicory, edible oils, ghee, soji, cumin, cinnamon, milk | 2 Units |
| 20. Role of yeast | 2 Units |
| 21. Food packaging- nutrition labeling and different types of packaging materials | 1 Unit |
| 22. Butter making | 1 Unit |
| 23. Importance and formation of Gluten | 1 Unit |
| 24. Sensory evaluation tests-taste identification test, taste intensity tests | 1 Unit |
| 25. Jelly making | 1 Unit |
| 26. Blanching | 1 Unit |
| 27. Simple fudge making | 1 Unit |
| 28. Preparation of vegetable stock | 1 Unit |
| 29. Practical based Assignment | |

REFERENCES:

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6. Srilakshmi B. Food Science 4th edition. New age International.
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