

Subject Description:

This is a course intended to familiarize the students with the knowledge on properties of foods and nutrients. It emphasizes the principles and methods involved in food preparation and product formulation, various preservation and processing techniques involved in home scale and food industry. It helps the students to acquire knowledge on food safety and quality standards. The goal of the course is to introduce the students to update the recent trends and research opportunities in Food Science and Technology.

Pedagogy:

The topics will be covered by lecture sessions along with hands on practical learning in the Food Science and Testing lab. Assignments will be focused on compilation of recent research advancements in the above area. Apart from these students are required to work on a research paper that involves recent review on allied areas.

Learning Objectives: To enable students

To understand the principles and acquire skills on food, its preparation, preservation and processing, product formulation, safety and quality standards and recent trends.

UNIT- I CHEMISTRY BEHIND FOODS

Definitions – Food, principle components of foods, functions of foods, classification of foods, properties of foods- Physical states of foods, chemical properties of water, proteins, fats, minerals, carbohydrates, nutrients its significance and imbalance, bioavailability of nutrients, pigments, food flavours, browning reaction in foods, Enzymes in foods and food industry.

UNIT II FOOD PRESERVATION AND PROCESSING

Food Processing: Status & scope of food processing industry in India. General principles and methods of food preservation, Preservation by addition of natural preservatives, Preservation by fermentation and other uses of microorganism. Food Preservation: Preservation by high temperature- Applications in food processing and preservation- pasteurization, sterilization, canning bottling, dehydration, irradiation, microwave heating. Cold preservation- types – refrigeration, freezing. preservation with chemicals - mechanism of microbial inhibition and action of preservatives in processed food. Inorganic & organic preservatives- chemical additives, antibiotics, mold inhibitors, antioxidants and its role.

UNIT III FOOD PREPARATION AND PRODUCT FORMULATION:

Food Preparation- Objectives of cooking, methods of cooking- conduction, convection, radiation, microwave heating. Cooking Media- air, water, steam, fat. Microwave cooking- Advantages and Limitations. Changes in cooking- Changes in proteins, carbohydrates, lipids, vitamins and minerals, colour. Standardization of Recipes, Sensory evaluation- selection of panels, preparation of samples, types of tests, judging, results. Analysis of Proximate nutrients

and Shelf life study, Packaging & Labelling of foods, Government regulations of food and nutrition labelling, value addition of foods, types of supplements-dietary, nutrient and herbal.

UNIT IV FOOD SAFETY AND QUALITY CONTROL

Quality factors in foods, Safety, hazards, risks, Food Deterioration and its control HACCP, FSSAI, Food standards, Food laws, Food Adulteration, Food safety testing, Food additives,

UNIT V RECENT TRENDS IN FOOD SCIENCE AND TECHNOLOGY RESEARCH

Food Biotechnology, functional foods, active compounds and active ingredients, nutraceuticals, Role of food technology in preventing malnutrition-fortification and enrichment, genetically modified foods, prebiotics, probiotics, new food additives, research methods, recent advances food industry, food technology and the environment.

TEXT BOOKS/ REFERENCES:

1. Potter, N. N., & Hotchkiss, J. H. (2012). *Food science*. Springer Science & Business Media.
2. Desrosier, N. W., & Desrosier, J. N. (1977). *The technology of food preservation* (No. Ed. 4). AVI Publishing Company, Inc..Food Technology- Prescott and Procter
3. Desrosier, N. W., & Desrosier, J. N. (1977). *The technology of food preservation* (No. Ed. 4). AVI Publishing Company, Inc..
4. Frazier, W. C., & Westhoff, D. C. (1988). *Food microbiology*. 4th.
5. Lal, G., Siddappa, G. S., & Tandon, G. L. (1960). *Preservation of fruits and vegetables*. Indian Council of Agricultural Research; New Delhi.
6. VanGarde, S. J., & Woodburn, M. J. (1994). *Food preservation and safety: principles and practice*.
7. Kadam, S. S., & Salunkhe, D. K. (1998). *Handbook of Vegetable Science and Technology* (No. 635 Sa381h Ej. 2 014949). Marcel Dekker,.