

## 17FT005 FOOD QUALITY AND SAFETY ENGINEERING

Hours Per Week :

L	T	P	C
4	1	-	4

Total Hours :

L	T	P	WARA	SSH/HS	CS	SA	S	BS
45	15	-	15	30	-	5	5	-

### Course Description and Objectives:

The course deals with global food safety laws, standards and regulations. The objective of the course is to impart knowledge to students on national and international food standards along with application of ISO and HACCP in food processing industries.

### Course Outcomes:

Upon successful completion of this course student should be able to:

- understand about toxins from bacteria and fungi.
- know about different food additives, anti-nutrients, anti-vitamins used in food processing.
- explain about heavy metal contamination in foods.
- discuss about food safety and microbial standards

### SKILLS:

- ✓ Identify the different sources of food contamination
- ✓ Categorize the contaminants on the basis of severity
- ✓ Prepare quality control charts for a given process
- ✓ Identify different allergens in foods
- ✓ Identify natural toxin present in food

#### UNIT – I

**Criteria for quality control :** Principles of food safety – Historical developments - need for quality control and safety- impact of food safety on world trade issues - strategy and criteria for food safety - microbiological criteria for safety and quality-sources of micro organisms for food spoilage –food borne diseases and their control - sampling plans and criteria for microbial assessments in foods food contaminants – physical, biological and chemical contaminants-factors affecting toxicity of compounds- quality control and food safety.

#### UNIT – II

**Source of contamination :** Causes of major failure of food safety – clothing and personal hygiene – –test for food safety. Quality control tools. Quality control chart – Quality factors in food – Nutritional labeling – Specification – Rules and Regulations - need for food plant sanitation — cleaning and cleaners – Water supply- Good Manufacturing Practice. Metal contaminants- Sources of health hazard of metallic contaminants.

#### UNIT – III

**Assessment of food safety:** General and acute toxicity – Mutagenicity and carcinogenicity. Additives (Intention – direct) – Preservatives – antioxidants, sweeteners, flavors, colours, vitamins, stabilizers – indirect additives – organic residues – inorganic residues and contaminants. Food allergy, food intolerance, contaminants of processed foods, solvent residue, contaminants of smoked foods. Cleaner production is food industry-fruit and vegetable processing, sea food processing, brewing and wine processing.

#### UNIT – IV

**Analytical Techniques in Foods :** Application and operating parameters of Spectrophotometry, AAS, GC, HPLC, GC-MS, ICP, DSC, TGA, SEM, Colorimeter.

#### UNIT – V

**Hygienic practices :** Process equipment and machinery auditing, consideration of risk, environmental consideration, mechanical quality control - personnel hygienic standards- preventative pest control, cleaning and disinfecting system, biological factors underlying food safety.

#### TEXTBOOKS:

1. David A. Shapton and Norah F. Shapton. 1991. Principles and Practices for the Safe Processing of Foods. ButterworthHeinemann Ltd, Oxford.
2. Chesworth, N. 1997. Food Hygiene Auditing. Blackie Academic Professional, Chapman and Hall.
3. Jose M. Concon. 1988. Food Toxicology, Part-A-Principles and concepts Part B - Contaminants and Additives, Marrcel Dekkar Inc. Newyork and Brazil.
4. Jacob, M. 2004. Safe Food Handling. CBS Publishers and Distributors, New Delhi.

#### ACTIVITY:

- Detection of different heavy metals in food products.

**REFERENCE BOOKS:**

1. AOAC International, "Official methods of Analysis", AOAC International, 18th edition, Gaithersburg, Mary Land, 2007.
2. Y. Pomeranz and C.E. Meloan, "Food Analysis: Theory and practice", 3rd edition, A.V.I Publishing Company, INC West Port, U.S.A, 2013.
3. J. Jayaraman, "Laboratory Manual in Biochemistry", 3rd edition, Wiley Eastern Publishers, New Delhi, 1980.
4. D. T. Plummer, "An introduction to Practical Biochemistry", 2nd edition, Tata Mc Graw- Hill Publishing Co., New Delhi, 1979.
5. S. Sadasivam and A. Manickam, "Biochemical methods for Agricultural Sciences", 2nd edition, New Age International Publisher, New Delhi, 1996.