

## Semester VI

### Food Toxicology and Industrial Waste Management

#### Objectives

The course enables the students to:

- 1) Have knowledge of the various toxins occurring naturally or introduced into food.
- 2) Acquire knowledge of the physical, chemical and microbiological parameters in food

	Subject	Total Credits	Th	Pr	Int	Ext	Total
	Food Toxicology and Industrial Waste Management	4	3	1	25	75	100

#### Food Toxicology and Industrial Waste Management Theory

ModuleNo.	Objectives	Content	Evaluation
<b>1</b>	<p><b>The module will enable the students:</b></p> <ol style="list-style-type: none"> <li>1. To develop an understanding of the possible effects of different toxins in foods.</li> <li>2. To obtain a knowledge of the various de-toxification methods.</li> <li>3. To acquire knowledge of the pathogenesis of some bacterial and fungal species.</li> </ol>	<p><b>Naturally Occurring Toxins in different foods:</b></p> <ul style="list-style-type: none"> <li>• Protease Inhibitors, Haemagglutinins, Goitrogens, Cyanogens, Cycads, Saponins, Gossypol, Lathyrogens, Favism, Allergens</li> <li>• Miscellaneous Toxic factors.</li> </ul> <p><b>Types of toxins:</b></p> <ul style="list-style-type: none"> <li>• Staphylococcus aureus</li> <li>• Bacillus cereus</li> <li>• Clostridium welchii</li> <li>• Mycotoxins</li> <li>• Bioassay of toxin.</li> </ul>	<p><b>25 marks</b></p> <p><b>Quiz</b></p> <p><b>Assignments</b></p> <p><b>Projects</b></p>
<b>2</b>	<p><b>The module will enable the students:</b></p> <ol style="list-style-type: none"> <li>1. To be aware of the possible toxicity of chemicals introduced during food processing.</li> <li>2. To be aware of the sources of various carcinogens.</li> </ol>	<p><b>Residual Chemicals present during food production and processing:</b></p> <ul style="list-style-type: none"> <li>• Chemical preservatives</li> <li>• Anti-oxidants</li> <li>• Pesticides.</li> <li>• Heavy Metals</li> </ul> <p><b>Carcinogens</b></p> <ul style="list-style-type: none"> <li>• Naturally occurring carcinogens</li> <li>• Carcinogens produced during</li> </ul>	<p><b>25 marks</b></p> <p><b>Quiz</b></p> <p><b>Assignments</b></p> <p><b>Projects</b></p>

		food processing and preservation and food colors.	
<b>3</b>	<p><b>The module will enable the students to:</b></p> <ol style="list-style-type: none"> <li>1. have an analytical knowledge of the various physical and chemical parameters in water.</li> <li>2. develop an understanding of the common sources of contamination and awareness of the potable water standards.</li> <li>3. be aware of the various water treatment methods.</li> </ol>	<p><b>Characteristics of Water:</b></p> <ul style="list-style-type: none"> <li>• Sources</li> <li>• General physical and chemical parameters of water</li> <li>• Characteristics of industrial and domestic waste water</li> <li>• Nature of effluents discharge from different food industry.</li> </ul> <p><b>Water Quality:</b></p> <p>Common impurities and contamination of water</p> <p>General purification methods</p> <p>Standards for potable water</p> <p>Quality Requirements for water used in different food industries</p> <p><b>Water Treatment</b></p> <p>Kinds of filters</p> <p>Disinfection methods</p> <p>Water softening methods</p> <p>Treatment of domestic water supplies and industrial effluent treatment.</p>	<p><b>25 marks</b></p> <p><b>Quiz</b></p> <p><b>Assignments</b></p> <p><b>Projects</b></p>

**References:**

1. A.P.H.A 1986.(Standard, Methods for the Examination of Water and Waste Water 16ed(American Public Health Association. Washington)
2. Conrunga D.M. and Landsdown A.D.C. , (1983), Toxins Input.
3. Furman N.H., Standard Method of Chemical Analysis.
4. Magnus Pyke, Food Science Technology.
5. Rangwala. S.C., Fundamentals of Water Supply and Sanitary Engineering.\
6. Rudolf.W. (1997) Industrial Waste., Allied Scientific Publishers,India.

## Food Toxicology and Industrial Waste Management Practical

### Objectives:

This course will enable the student to:

- 1) Develop analytical skill.
- 2) Understand the nature of contaminants in water and food.

Module No.	Objectives	Topic and Details	Assessment
	<p><b>The Module will enable the students to:</b></p> <ol style="list-style-type: none"><li>1. To analyze some important chemical parameters in water.</li><li>2. Understand the nature of bacterial and fungal contamination.</li></ol> <p>To have a knowledge of probable contamination in some foods.</p>	<p>Estimation of the following</p> <ol style="list-style-type: none"><li>1. Acidity.</li><li>2. Chlorides.</li><li>3. Calcium.</li><li>4. Alkalinity.</li><li>5. Hardness.</li><li>6. COD.</li><li>7. DOD.</li><li>8. Dissolved oxygen.</li><li>9. Monosodium Glutamate (MSG).</li><li>10. Boric acid in milk.</li><li>11. SO<sub>2</sub>.</li></ol> <p>Culture studies of Bacillus cereus.</p> <ul style="list-style-type: none"><li>- Culture studies of E. coli.</li><li>- Isolation of toxigenic fungi.</li></ul>	<p><b>Performing practicals-20 marks</b></p> <p><b>Journal-5 marks</b></p>

### References:

1. American Public Health Association. 16ed, Washington.
2. Rakesh. J.P and Kiran.R.P (2000)-Microbiology Vol.2 Aditya., Ahmadabad.
3. 1. A.P.H.A 1986, Standard, Methods for the Examination of Water and Waste Water.
4. Sirockin.G.& Cullimore,S. (1969) Practical Microbiology.