

3.	Plant biotechnology in foods (Application to food production, food industries, pharmaceuticals, and agriculture)	6
4.	Cell Culture and Food (Brewing, dairy biotechnology, food additives), Diagnostic Systems (How and Why and application in food)	7
5.	Biotechnological Approach for the exploitation of food and industrially important microorganism, Bio Gas Plant	6
6.	Industrial Cell culture (Downstream processing Ethics and safety of food biotechnology products Regulations of food biotechnology	7
Total		42

Books: -

S.No.	Name of Books/ Author/Publisher
1.	Name of Books/ Author/Publisher
2.	Advances in Biotechnology Vol.1, (Scientific and Engineering principles). Murray Moo-Young, C.W. gambell and C.Vezina
3.	Advances in biotechnology Vol-II, (Fuels, chemical, food and waste treatment) Murray Moo-Young, C.W. gambell and C.Vezina
4.	Introduction to Plant Biotechnology, H. S. Chawla, 2004
5.	Fundamentals of Food Biotechnology By Byong H. Lee, wiley publications, 2015

WASTE WATER TREATMENT

Details of course:-

Course Title	Course Structure			Pre-Requisite
	L	T	P	
Waste Water Treatment (BT427)	3	1	0	Nil

Course Objective:

To understand the basics of waste Water Treatment and apply these principles on real world case studies.

Course Outcome (CO):

1. Understand methods of industrial waste disposal and their effects on streams and sewerage systems.
2. Analyze the characteristics and toxic byproducts of wastes from various industries.
3. Explore methods for waste reduction, recycling, and economic sustainability in waste management.
4. Learn about unit operations and design for treating solid, liquid, and gaseous wastes.
5. Understand landfill design, operation, gas recovery, and site monitoring.
6. Apply waste management principles through real-world case studies.

S.No.	Content	Contact Hours
1.	Waste disposal management: Methods of waste disposal: industrial waste (solid, liquid and gaseous emission), effect of industrial wastes on streams and sewerage systems, Treatment system of waste disposal e.g. Incenerator, differences in waste quality and quantity, physico-chemical and biological treatments of waste and their evaluation in respect of treatment.	7
2.	Characteristic features of wastes (solid, liquid and gaseous emission), manufacturing processes and toxic byproducts generated from iron, ore, alumina, heavy metals units, paper and pulp industries, pesticides industry, thermal power station, distillery, textile and crude oil industry.	6
3.	Small- and large-scale industries for waste reduction and remediation, various methods for waste alteration, volume and strength minimization, recycling plants, material restoration and conservation. Methods for neutralisation, equalization, precipitation and solidification for waste handling. Economic sustainability and government support for joint treatment of raw effluent, municipal sewage and debris	7
4.	Unit operations and their design for treatment and management of wastes (solid, liquid and gaseous).	8
5.	Landfill design and operation including: site selection, engineered sites, liners and covers, leachate control and treatment, gas recovery and control, including utilization of recovered gas (energy), and landfill monitoring and reclamation.	8
6.	Case studies	6
Total		42

Books: -