

Textile Effluent and its Management - Web course

COURSE OUTLINE

40 lectures will be used to cover topics such as methods different aspects of Textile Effluents and its management to save the environment from polluting the same. As textile industry is one of the largest industries in the world and different fibres such as cotton, silk, wool as well as synthetic fibres are all pretreated, processed, coloured and after treated using large amounts of water and a variety of chemicals, there is a need to understand the chemistry of the textile effluents very well. The textile waste characteristic needs to be understood clearly. The removal of colour from textile industry and dyestuff manufacturing industry wastewaters represents a major environmental concern. Conventional oxidation treatment have found difficulty to oxidize dyestuffs and complex structure of organic compounds at low concentration or if they are especially refractory to the oxidants. To ease the stated problems advanced oxidation processes (AOPS) have been developed to generate hydroxyl free radicals by different techniques. AOPS processes are combination of ozone (O₃), hydrogen peroxide (H₂O₂) and UV irradiation, which showed the greatest promise to treat textile wastewater. Major pollutants in textile wastewaters are high suspended solids, chemical oxygen demand, heat, colour, acidity, and other soluble substances whose chemistry will be emphasised.

COURSE DETAIL

S.No	Topics
Lecture 1	Textile Effluent –An Introduction
	1.1 Textile Wastes Characteristics 1.2 Textile Wastewater Problems 1.3 Chemicals Used in Textile Industry 1.4 Treatment of Textile Effluents
Lecture 2	Textile processing Chemistry
	2.1 Textile Raw Materials 2.1.1 Fibres 2.1.2 Chemicals 2.2 Type of Textile Processing 2.2.1 Preparation 2.2.2 Mercirization 2.2.3 Colouring 2.2.4 Finishing 2.2.5 Chemical Preparation 2.2.6 Mechanical Operations
Lecture 3	Pollution Control at Mill Stage

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**Textile
Engineering**

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	<ul style="list-style-type: none"> 3.1 Waste Sources <ul style="list-style-type: none"> 3.1.1 Cotton 3.1.2 Wool 3.2 Water and Chemical Recovery and Reuse <ul style="list-style-type: none"> 3.2.1 Cotton 3.2.2 Wool 3.2.3 Synthesis 3.3 Wastewater Treatment <ul style="list-style-type: none"> 3.3.1 Treatment with Activated carbon 3.3.2 Treatment by roots of Weeds
Lecture 4	Standards for Textile Effluent
	<ul style="list-style-type: none"> 4.1 Nature of the Problem 4.2 Treatment System <ul style="list-style-type: none"> 4.2.1 Effluent treatment System----- Rural Area 4.2.2 Effluent Treatment System----- Urban Area
Lecture 5	Techniques for Effluent Treatment
	<ul style="list-style-type: none"> 5.1 Chlorine dioxide Treatment 5.2 Ozone Treatment 5.3 Membrane Technology <ul style="list-style-type: none"> 5.3.1 Microfiltration 5.3.2 Ultrafiltration 5.3.3 Nanofiltration 5.3.4 Reverse Osmosis 5.3.5 Electrodialysis 5.4 Enzymatic Decolorization 5.5 Other Technologies
Lecture 6	Biomass Based Technologies
	<ul style="list-style-type: none"> 6.1 Wastewater Decolorization 6.2 Chitin and Chitosan <ul style="list-style-type: none"> 6.2.1 Sorption of Dyes 6.2.2 A Study of Dye Binding Properties 6.3 Chitosan Fibres 6.4 Other Biomass System
Lecture 7	Effluent Testing
	<ul style="list-style-type: none"> 7.1 Parameters and Pollutants 7.2 Testing of Pollution Parameters 7.3 Regulations in Developed Countries 7.4 Eco-Friendly Processing
Lecture 8	Effluent Quality Assurance Programme
	<ul style="list-style-type: none"> 8.1 Waste Auditing and Minimization <ul style="list-style-type: none"> 8.1.1 Elements of Waste Minimization Assessment 8.1.2 Programme initiation 8.1.3 Data Collection and Audit Preparation 8.1.4 Waste Audit

	8.1.5 Identification of waste Minimization Alternatives 8.1.6 Feasibility Analysis 8.2 Waste Assessment Report 8.3 Monitoring and Re-Evaluation
Lecture 9	Sizing Effluent Treatment
	9.1 Sizing and Desizing Technology 9.1.1 Sizing Agents 9.1.2 Desizing Agents 9.2 Desizing Effluent Treatment 9.3 Recycle of Textile Desizing Effluents 9.4 Ultrafiltration for Size recovery 9.4.1 Ultrafiltration Membranes 9.4.2 Ultrafiltration Module types 9.4.3 Ultrafiltration Plant Configuration 9.4.4 Ultrafiltration Pilot Plant 9.4.5 Maintenance
Lecture 10	Color Removal Technologies
	10.1 Biotechnology approach 10.2 Color and Organic Pollutant Removal 10.3 Anaerobic –Aerobic Treatment process
Lecture 11	Sludge Management
	11.1 Source Reduction of Sludge 11.2 Bioelimination of Sludge 11.3 Solids Separation 11.4 Sludge Treatment process 11.5 Solid Waste Disposal of Textile Industry
Lecture 12	Effluent Treatments--- A Case Study
	12.1 Practical Approach 12.2 Typical Effluent Treatment Plant 12.3 Cost Estimation 12.4 A Case Study
Lecture 13	Government Regulations for Effluents
	By Bureau of Indian Standards