



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering Syllabus

Subject Code : 3154404

Subject Name : Waste to Energy

WEF Academic Year :	2021-22
Semester :	5
Category of the Course :	Professional Elective

Prerequisite : Basic Concepts of fermentation, combustion, incineration and heat pyrolysis, gasification & anaerobic digestion.

Rationale : The objective of the course is to provide insights into waste management options by reducing the waste destined for disposal and encouraging the use of waste as a resource for alternate energy production. This course is designed to provide an understanding of the various aspects of Waste to Energy. The various sources of waste generation is analysed with a focus on its potential for energy production. The need for characterization of wastes will be discussed along with the existing norms for waste utilization for alternate energy source. Various Technological options available for the production of energy form waste will delineated along with economics of using alternate sources. Case studies will be discussed to provide a better understanding of the concepts of “Waste to Energy” in the Indian context.

Course Scheme :

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Practical		
				ESE (E)	PA(M)	ESE (V)	PA (I)	
3	0	0	3	70	30	0	0	100

Course Content :

Sr. No.	Course Content	No. of Hours	% of Weightage
1	Characterization of wastes, Energy production from wastes through incineration, incineration	6	14
2	Energy production from wastes through gasification, Syngas utilization, Energy production from wastes through pyrolysis, gasification, Pyrolysis,	9	18
3	Densification of solids, Efficiency improvement of power plant, Energy production from waste plastics, Gas clean up, Energy production from organic wastes through anaerobic digestion, Design of anaerobic digester,	11	20
4	Introduction to Microbial fuel cells, Energy production from organic wastes through fermentation, anaerobic digestion, fermentation	8	17
5	Energy production from wastes through transesterification, transesterification	6	14
6	Cultivation of algal biomass and treatment of waste water, Energy production form algal biomass	6	17



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Reference Book :

1. Waste to Energy by S. Syngellakis.
2. Waste-to-Energy: Technologies and Project Implementation by Marc J. Rogoff, Francois Screve.
3. Waste to Wealth by Reeta Rani Singhania, Rashmi Avinash Agarwal, R. Praveen Kumar, Rajeev K Sukumaran.
4. Waste-to-Energy: Advanced Cycles and New Design Concepts for Efficient Power Plants by Lisa Branchini.
5. Waste to Sustainable Energy: MFCs – Prospects through Prognosis by Durga Madhab Mahapatra, Lakhveer Singh.
