



# GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Engineering

Level: UG

Branch: Food Engineering & Technology

Subject Code: 3175107

Subject Name : Applications of Renewable Energy in Food Processing

WEF Academic Year :	2022-23
Semester :	7
Category of the Course :	Open Elective - III

**Prerequisite:** Nil

**Rationale:** This subject introduces the use of renewable energy sources in food processing operations to promote sustainability, energy efficiency, and environmental safety. It prepares students to integrate solar, biomass, wind, and other clean energy systems into food industry practices.

**Course Scheme:**

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
L	T	P		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	Introduction to energy sources; classification of renewable energy sources, utilization of these sources in food processing sector.	4	10
2	Solar radiation, measurement of solar radiation, types of solar collectors and their uses; familiarization with solar energy gadgets: solar cooker, solar concentrator, solar dryer, solar steam generator; utilization of solar thermal energy in food processing.	10	20
3	Solar photovoltaic cells, modules, arrays, conversion process of solar energy into electricity, applications in food industry.	5	15
4	Biomass and its characterization; briquetting of biomass. Biomass combustion, pyrolysis, gasification and uses of gasifiers in food industry and biodiesel preparation.	10	20
5	Importance of biogas technology, production mechanism, types of biogas plants, uses of biogas, handling & utilization of digested slurry. Use of food waste for biogas generation and its applications.	10	20
6	Brief introduction to wind energy, hydroelectric energy, ocean energy	4	15

**Reference Book:**

1. Rai, G.D. 2013. Non-Conventional Energy Sources, Khanna Publishers, Delhi.



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2. Rai, G.D., Solar Energy Utilization, Khanna Publishers, Delhi.
3. Khandelwal, K.C. & S. S. Mahdi. 1990. Biogas Technology- A Practical Handbook.  
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