WASTE TO ENERGY CONVERSION

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PRE-REQUISITES : BE in Chemical, Mechanical, Environmental Eng., Biotech.

INTENDED AUDIENCE : It is a Elective Course for PG and UG with Hon.

COURSE OUTLINE :

The course deals with the production of energy from different types of wastes through thermal, biological and chemical routes. It is intended to help the young scientific professionals to keep their knowledge upgraded with the current thoughts and newer technology options along with their advances in the field of the utilization of different types of wastes for energy production.

ABOUT INSTRUCTOR :

Prof. Prasenjit Mondal, is presently working as Associate Professor in the Department of Chemical Engineering, Indian Institute of Technology Roorkee, India. He joined the institute in 2009 as Assistant Professor. He has also worked as Process Engineer in industry for two years and as scientist in Centre for Scientific and Industrial Research, India for three years before joining IIT Roorkee. His area of research is Energy and Environmental Engineering (Water /wastewater treatment through adsorption, electrocoagulation and biological processes including phytoremediation, microbial fuel cells, oil from algae, energy from coal, biomass and wastes, life cycle assessment). He has handled number of R&D projects sponsored by Industry, Govt. of India and International Agencies. Presently he is engaged with two international projects under Australia India Strategic Research Fund and Indo-France Water Network Scheme. He has published one book and more than 100 papers in international journals and conference proceedings. He is the recipient of NTSE scholarship, MHRD fellowship, Govt. of India and S.J. Jindal Trust's scholarship, 3 year membership award of American Chemical Society. He is holding the position of Chairman Community Dairy, IIT Roorkee. He is a reviewer for several international journals including Environmental Progress and Sustainable Energy. He is a life member of the Indian Institute of Chemical Engineers and the treasurer of Biological Engineering Society, India.

COURSE PLAN :

Week 1: Introduction, characterization of wastes.

Week 2: Energy production form wastes through incineration,energy production through gasification of wastes.

Week 3: Energy production through pyrolysis and gasification of wastes, syngas utilization.

Week 4: Densification of solids, efficiency improvement of power plant and energy production from waste plastics.

Week 5: Energy production form wastes Plastic,gas cleanup.

Week 6: Energy production from organic wastes through anaerobic digestion and fermentation, introducation to introducation to microbial fuel cells

Week 7: Energy production from wastes through fermentation and transesterification

Week 8: Cultivation of algal biomass from wastewater and energy production from algae