Indian Institute of Technology Kanpur

Course Proposal

Indian Technical and Economic Cooperation Programme

Title of the Course: **Industrial and Electronic Waste Recycling and Management**

Item	Details
Title of the Course	Industrial and Electronic Waste Recycling and Management
Course Coordinators	• Dr. Arunabh Meshram, Department of Materials Science and Engineering
Duration	One week
Eligibility Criteria (basic expected background)	Background of basic science and mathematics (general exposure to materials science will be beneficial)
Target group	Teachers of Engineering/Management disciplines, Research Scholars (Engineering and Science disciplines)
Tentative dates for the proposed event	Mar. 10- Mar. 15, 2025
No. of days of training	5 days (approximately 40 hours)
Objectives	The course 'Industrial and Electronic Waste Recycling and Management' focuses on the following: • To foster inclination towards material recycling, recovery and reuse of industries and electronic waste streams • To develop fundamentals of recycling, followed by in-depth analysis of raw feed and recycled products • To appreciate various processes involved in material recycling, energy and material balance of a system • To develop general awareness of a global issue of industrial and electronic waste • To facilitate the development of future scope in material recycling, innovative approach and public awareness
Tentative list of topics to be covered	This course will provide a holistic view of material recycling and management with hands-on experimental/ laboratory sessions to enhance the understanding of materials. Following are the key topics to be covered in this course: 1. Introduction to Industrial and Electronic wastes, categories and understanding recycling processes 2. Fundamentals of metallurgical processes governing material recycling and general awareness 3. Electronic waste recycling I: Waste Printed Circuit Board, delamination and metal recovery 4. Electronic waste recycling II: Spent batteries and recovery of valuable materials from waste electrodes, Environmental impacts of materials recycling *Laboratory Session #1*: Learning the importance of material sorting in E-waste recycling 5. Industrial waste recycling I: Aluminium industrial waste, dross, scrap, red mud, spent pot lining, salt slag

	6. Industrial waste recycling II: Copper industrial waste, smelter slags, raffinates, spent electrolytes 7. Industrial waste recycling III: Zinc industrial waste, zinc ash, zinc dross, flue dust and scraps 8. Industrial waste recycling IV: Iron and Steelmaking waste, scraps, ironmaking slag, steelmaking slag and wastewater Laboratory Session #2: Learning material recovery through hydrometallurgy