GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3162116
Semester – VI
Subject Name: Industrial waste management

Type of course: Open Elective

Prerequisite: Basic knowledge of ferrous and non-ferrous extraction

Rationale: Industrial waste is becoming serious issue day by day. Industrial waste may be hazardous or non-hazardous waste. Waste may be toxic, ignitable, corrosive, reactive, or radioactive. Metallurgical industrial waste may pollute the air, the soil, or nearby water sources, eventually ending up in the sea. Thus industrial waste needs to be utilized with a view to minimize the negative impact on the environment. Waste utilization may end up with value added products.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	ESE (V)	PA (I)	
2	1	0	3	70	30	0	0	100

Content:

Sr. No.	Content	Total Hrs
1	Introduction: primary metals, secondary metals, waste, different industrial wastes, need of waste utilization, fundamentals of ISO 14000	**5**
2	Recovering Aluminium and other metals from Bayer plant Liquors, red mud and waste, slag and scrap	**5**
3	Recovering Copper from waste, slag and scrap	**5**
4	Recovering Lead, Zinc and Tin from waste, slag and scrap	**5**
5	Utilization of blast furnace, steel and other metal extraction plant's slag and waste, Utilization of metallurgical wastes: Utilization of by-products, cement, insulation materials, slag wool, SLAG-CERM from various slags.	**8**
	Total	**28**

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
15	**35**	**50**	**0**	**0**	**0**

GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3162116

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Text Books:

1. Extraction of non-ferrous metals by H S Ray R Sridhar K P Abraham, East West press pvt Ltd.
2. Dennis, W H Metallurgy of the Nonferrous metals, Pitman London 1954.

Reference Books:

1. T.T.Shen, "Industrial Pollution Prevention", Springer, 1999.
2. H.M.Freeman, "Industrial Pollution Prevention Hand Book", McGraw-Hill Inc., New Delhi, 1995.
3. Bishop, P.L., "Pollution Prevention: Fundamental & Practice", McGraw-Hill, 2000.

Course Outcomes:

Sr. No.	CO statement	Marks % Weightage
CO-1	Identify industrial waste	15
CO-2	Explain metal recovery from metallurgical industry waste	50
CO-3	Utilize metallurgical industry waste to get useful products	35

List of Open Source Software/learning website:

www.nptel.ac.in