	Departm	ent of Metallurgical	and Materia	als Engineer	ring			
Course	Title of the course	Program Core	Total Number of contact hours				Credit	
Code		(PCR)/	Lecture	Tutorial	Practical	Total		
		Electives (PEL)	(L)	(T)	(P)	Hours		
MME713	Fuel, Furnace and	PEL	3	0	0	3	3	
Refractories								
Due ve esticite e		G 4	, ,1 1	(6 :	(CIT) 1 1		(E.A.))	
Pre-requisites  MMC 201: Thermodynamics &		Course Assessment methods (Continuous (CT) and end assessment (EA))						
MMC-301: Thermodynamics &		CT+EA						
Kinetics of Engineering								
Materials		Du Cuganta Duamanile						
Developer								
Course		I. To evaluate the property of Fuel						
Outcomes	Understanding the different energy sources_ Conventional and Non- Conventional III. Understanding the Environmental Impact for usage of all IV. Understanding the design of furnace with respect to usage of fuel and Refractories							
V. Understanding the different properties and usage of it n different areas								
Topics Definition Comparative study of solid liquid and assessed field Constitution								
Topics Covered								
Covered		Testing of fuels like: Grindability, Caking properties, calorific value, Proximate and						
		- · · · · · · · · · · · · · · · · · · ·	t, viscosity. Non-conventional Energy Resources like					
	Nuclear fuel, So	Nuclear fuel, Solar, Wind, Geo-thermal, Bio-mass, Hydrogen (6h)						
Carbonization of coal: Coke making and by-products. Producer gas, Water gas, N							tural	
	gas, LPG, Blast furnace gas, Coke oven gas, LD gas Gobar Gas. Storage of fuels.							
Combustion of fuels and problems based on air supplied, excess air and products						products of	f	
	l	combustion. (10h) Definition and Classification of Furnaces, Batch furnaces, Continuous furnaces. (5h)						
Definition and Classification of Furnaces, Batch furnaces, Continuous furnaces. Construction and working of furnaces like Cupola, Induction furnace, Arc furnace, furnace, Pit furnace, Rotary furnace, Muffle furnace etc. Evolution of heat and flame temperature. Available heat. Natural, forced, in							` /	
							(6h)	
							` /	
	balanced draft.	himney height, Heat losses in furnaces and minimization. Waste heat						
recovery.							(7h)	
		Nature and Type of Refractories, Manufacture of Common Refractories; Properties of						
	retractories; La	refractories; Lay out of Refractories in a furnace. (10h)						
Text Books	s, Text Books:							
and/or	, I CAL BOOKS.							
reference	1. Elements of F	Fuels, Furnaces and Refractories, O. P. Gupta, Khanna publication.						
material		2. Fuels, Furnaces and Refractories, J. D. Gilchrist						
	3. Fuels, Furnac	3. Fuels, Furnaces, Refractories and Pyrometry,-A.V.K. Suryanarayana, B. S. Publication						
		naces - Vol. I & II, W. Trinks and M. H. Mawhiney, Wiley						
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