UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING, ROURKELA

LESSON PLAN

SUBJECT-MECHANICAL OPERATION

PREPARED BY- SOVAN SAHOO

DEPARTMENT OF CHEMICAL ENGINEERING

	Topics covered
WEEK 1	Objectives of size reduction
	State laws of crushing like Bonds law,
	State laws of crushing like Rittinger's law,
	State laws of crushing like Kick's law
WEEK 2	Crushing efficiency,work index
	solve simple problems based on Bonds law,
	solve simple problems based on Rittinger's law
WEEK 3	solve simple problems based on Kick's law
	solve simple problems based on Crushing efficiency
	solve simple problems based on work index
WEEK 4	Classification of size reduction equipment
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	Jaw crusher
	Gyratory crusher
WEEK 5	Smooth roll crusher
	Hammer Mill
	Ball Mill
	Closed and open circuit grinding
WEEK 6	dry and wet grinding
	free and choke grinding
	Objectives of size separation
	Shape and size of particles
WEEK 7	Different types of screen analysis
	Ideal screen & actual screen
	Material balance

WEEK 8	Construction and operation of different types of industrial screens
	Industrial screens and their effectiveness
	Industrial screens and their effectiveness
WEEK 9	Construction and operation of air filters, air separator
	Magnetic and Electromagnetic separation
	Theory of settling like free and hindered settling,
WEEK 10	Stroke's law, Classification
	Sedimentation, thickeners,
	Hydraulic classifiers, jigs,classifier
WEEK 11	Riffled table and their use
	Principle & operation of froth floatation and its use.
	Types of filtrations
WEEK 12	Theory of filtration,
	Types of cakes, cake resistance, pressure drop,
	Filter medium, filter Aids and related derivation
	Classification,constructions and working principles of filtration equipments,Thickeners
WEEK 13	Batch centrifuges with their construction, operation and uses
	Continuous centrifuges with their construction, operation and uses
	Flocculation, coagulants and role of coagulant in filtration
WEEK 14	Objectives of mixing
	Mixing of liquid with liquid
	Mixing of viscous materials
	Mixing of Solid with solid &Mixing of gases with liquids
WEEK 15	Flow pattern in agitated vessels
	Methods of prevention of swirling and vortex formation, baffling
	Different impellers, propellers, paddles used in mixing operation
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WEEK 16	Objectives of transportation and storage
	Belt conveyor
	Apron conveyor
	Screw conveyor
WEEK 17	Bucket conveyor
	Scrapper and pneumatic conveyors
	Storage and handling of solids; construction and uses of silos and bins.
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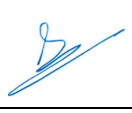
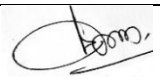
BOOKS FOR REFERENCE:

- Chemical Technology by C Dryden, Tata Mc Grawhill Publication
- Chemical Process Industries by N Shreeve, Tata Mc Grawhill Publication

	Prepared by	**Approved by**
Signature		
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SESSION	**2024-25**	