PHYSICAL SEPARATION PROCESSES LAB

Course Type	Course Code	Name of the Course	L	T	P	Credits
DP2	FMC252	Physical Separation Processes Lab	0	0	3	3

Course Objective
To provide students with practical exposure to various physical separation techniques used for upgrading the quality of coal and minerals.
Learning Outcomes
After completion of this course, the students will have hands-on knowledge on • Different techniques of coal and mineral beneficiation based on differences in the physical properties • Working principle of typical coal and mineral beneficiation equipment • Working with laboratory models of these beneficiation equipment

Unit No.	Name of the experiment	Lecture Hours	Learning Outcome
1	Float-sink test for coal washability analysis	3	To understand the washability characteristics of coal for subsequent density separation
2	Effect of time on the performance of jig	3	Understanding the effect of time on jig performance
3	Effect of pulse characteristics (frequency and amplitude) on the performance of jig	3	Understanding the effect of pulse characteristics on jig performance
4	Effect of feed solid concentration on the performance of spiral concentrators	3	Knowledge of process parameters that affect the performance of spiral concentrators
5	Effect of splitter position on the performance of spiral concentrators	3	Importance of splitter position in the separation process
6	Effect of wash water flowrate and oscillation amplitude on the performance of Mozley mineral separator	3	Understanding the effect of process parameters on the performance of Mozley mineral separator
7	Effect of inclination angle on the performance of Mozley mineral separator	3	Understanding the effect of inclination angle on the performance of Mozley mineral separator
8	Effect of wash water flowrate on the performance of Wilfley tables	3	Knowledge of the working of Wilfley table and the importance of wash water flowrate
9	Effect of magnetic field intensity in Davis' tube	3	Effect of magnetic field intensity on the determination of magnetics content in a Davis' tube
10	Effect of magnetic field intensity and roll speed on the performance of induced roll magnetic separator	3	Understanding the effect of magnetic field intensity and roll speed on the performance of induced roll magnetic separator
11	Effect of field intensity on the separation performance of a Wet high intensity magnetic separator	3	Understanding the effect of field intensity on the separation performance of a Wet high intensity magnetic separator
12	Effect of matrix type on the separation performance of a Wet high intensity magnetic separator	3	Knowledge of the impact of different matrix types on the separation performance of a Wet high intensity magnetic separator
13	Effect of roll speed and feed rate on the separation performance of Perm roll magnetic separator	3	To know the effect of roll speed and feed rate on the separation performance of Perm roll magnetic separator

14	Effect of process parameters on the performance of an electrostatic separator	3	Understand the working of an electrostatic separator and the effect of the process parameters on its separation
	Total hours	**42**	

Text Books:

1. Wills' Mineral Processing Technology by Barry A. Wills James Finch, Butterworth-Heinemann
2. Coal Preparation by Joseph W. Leonard III, Society for Mining, Metallurgy and Exploration
3. Magnetic methods for the treatment of minerals by J. Svoboda, Elsevier

Reference books:

1. Mineral processing design and operations by A. Gupta and D. Yan, Elsevier
2. Introduction to Mineral Processing by Errol G. Kelly, David J. Spottiswood, Wiley
3. Gravity Concentration Technology (Developments in Mineral Processing, 5) by Richard O. Burt, Chris Mills, Elsevier
4. High Gradient Magnetic Separation by Richard Gerber, Robert R. Birss, Research Studies Press