

6th Semester		Process Equipment Selection and Flowsheet Design	L-T-P 3-0-0	3 CREDITS
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Module I:**(8 hours)**

Sampling and Testing: Sampling a mineral deposit for feasibility studies and metallurgical testing. Metallurgical testing procedures. Metallurgical flow sheet development. General guidelines for plant design. Size selection for a mineral beneficiation plant and for a coal preparation plant.

Module II:**(8 hours)**

Brief review of mineral engineering unit operations. Size reduction and energy requirement. Selection and design features of Crushing and Grinding Equipment like Jaw crusher, Cone crusher, Roll crusher, Ball mill, Rod mill, Autogenous mill etc.

Module III:**(8 hours)**

Selection and sizing of various types of screen, screen efficiency, straight and curved screen, Selection and sizing of different classifiers including hydrocyclone.

Module IV:**(8 hours)**

Free and hindered settling, Selection and sizing of gravity separation equipment like jig, table, spiral etc. Preparation of heavy medium. General overview of magnetic and electrostatic separator selection.

Module V:**(8 hours)**

Solid and water balance calculations for the estimation of flow rates in beneficiation circuits. Flow sheet development for a coking coal and non-coking coal washery. Flow sheet development for Iron ore, copper and beach sand beneficiation plants.

Books:

- [1] Mular A.L. and Bhappu R. B., Mineral Processing Plant Design, Society of Mining Engineers of the American Institute of Mining, Metallurgical, and Petroleum Engineers
- [2] Gupta A., Yan D.S., Mineral Processing Design and Operation: An Introduction, Elsevier Science, 2016
- [3] Malhotra D., Taylor P.R., Spiller E. and LeVier M., Recent Advances in Mineral Processing Plant Design, Society for Mining, Metallurgy, and Exploration (SME), 2009