



CHEMISTRY
(Inter Disciplinary Course)
(3rd Semester)

Course No.: **CHM-IDC-201**

Heritage of Indian Metallurgy

Contact Hours: 60; Credits: 03

Full Marks = 100 [End Semester Exam (70) Internal Assessment (30)]

Pass Marks = 40 [End Semester Exam (28) Internal Assessment (12)]

Unit 1: History of metallurgy

What is Metallurgy, Ore and minerals, Metallurgy in Indian Social Context, Seven metals of antiquity, Importance of metals in human civilization, early evidence of metal in the Indian subcontinent, reference of precious metals (Copper, Gold, Silver, etc.) in ancient Indian scripts, Notable archaeological digs related to Indian metallurgy. Alloy: Definition, applications.

Unit II: Landmarks of Indian metallurgy

Metallurgy before and during the Harappan Civilization, first evidence of copper in the Indian subcontinent, discovery of bronze and its applications, alloying ranges on bronze, metal artefacts produced by the Harappans, lost-wax technique for metal sculpture.

Unit III: Coinage of India: Metallurgy of Currency

Origin of metallic currency in Indian subcontinent, Weight standards of coins in Indus Valley civilization: ratti, Satamana, Karshapana. Origins of Indian punch-marked coinage: Indian Karshapana coins, Cast Copper Coins, Die struck coins, Svarna coins. 'Copper Hoard' culture.

Unit IV: Iron Metallurgy

History of Iron Age in Ganges civilization, process of iron-smelting. Indian Wootz steel: definition, production technique, applications of Wootz steel. Role of carbon in steel. Wrought iron: production method, mechanism of Rust-resistance of the Iron Pillars in Delhi, Dhar (Madhya Pradesh) and Kodachadri Hill (coastal Karnataka).

Unit V: Metallurgy of other metals of importance

Gold, Silver, Zinc, Tin: Ores of zinc, method of extraction, applications.

Suggested Readings

1. History of Metallurgy, 2nd Edn, R. F. Tyleote.
2. A History of Metallurgy in India, G. Singh.
3. Science and Metal Technology of Harappans, D. P. Sharma.
4. Coins of Ancient India, Alexander Cunningham, Franklin Classics trade Press, 2018.
5. The Metallurgy of Iron and Still ... Vol I, The Metallurgy of Iron, Thomas Tuner, British Library, 2011.
6. A Text Book on Metallurgy of Gold, Silver, Copper, Lead and Zinc, by International Correspondence Schools, Legare street press, 2022