Smelting Science

This collection of modules is mostly based on **John E. Rehder's** remarkable book: "*The Mastery and Uses of Fire in Antiquity*". It was a real eye-opener for me.
What will be covered is.

1. **Furnace and Fire**
   How hot can it get? Containing heat flow and making the best out of bio fuel.
2. **Charcoal Technology**
   Are all charcoals created equal? What makes a charcoal fueled fire different from a wood fire? How about producing carbon monoxide?
3. **Smelter Technology**
   Basics of CO production and smelter design. The role of the tuyere. Why do we have several important temperatures in efficient smelting?
4. **Supplying Air to Smelters**
   Supplying air by blow pipes, natural draft, wind, and bellows. Why bellows make the difference.
5. **Slag and Different Ways of Smelting**
   Limits to the size of a smelter. Is hotter always better? Why is slag so good for you? How did the "messy and inefficient" very early smelting work? Smelting in crucibles.
6. **Getting Serious about Smelting Iron**
   Boudouard equilibrium and Baur-Graessler diagram. Why theory shows that smelters can only produce carbon-lean wrought iron, and why real smelters produce everything including high carbon steel and cast iron.