

7 th Semester	RMM7D004	Alternative Routes of Iron making	L-T-P 3-0-0	3 Credits
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Module-I: (09 hours)

Characteristics of raw materials and their preparation. Thermodynamics and Kinetics aspects.

Direct Reduction Processes:

Reduction of Iron bearing materials in shaft furnace, rotary kiln, retort and fluidized bed with special reference to reductant, energy consumption and operational problems.

Module-II: (09 hours)

Commercially available processes: like SL/RN, ACCAR, Krup-CODIR, Kingdon Meter, MIDREX, HyL, Purofer, Iron Carbide, etc.

Uses of DRI in steel making, iron making and foundries; effect on DRI on EAF performance and product characteristics.

Module-III: (09 hours)

Smelting Reduction Processes:

COREX, ROMELT, Fluidized bed reactors, Hismelt etc. Present status of alternative methods of iron making in India.

Module-IV: (09 hours)

Smelting Reduction Processes:

COREX, ROMELT, Fluidized bed reactors, Hismelt etc. Present status of alternative methods of iron making in India.

Books:

1. Alternative Routes of Iron Making by Amit Chatterjee, PHI.
2. Alternative Routes to Iron Making by A.Sarangi and B.Sarangi, PHI-2016
3. Beyond the Blast Furnace by Amit Chatterjee.
4. Direct Reduction of Iron, Editors: Jerome Feinman& Donald R.Mac Rae, Allied Publishers Ltd.

Digital Learning Resources:

Course Name: Iron making
 Course Link: <https://nptel.ac.in/courses/113/108/113108079/>
 Course Instructor: Prof Govind S Gupta

Course Name: Iron making and Steel making
 Course Link: <https://nptel.ac.in/courses/113/105/113105098/>
 Course Instructor: Prof. Gour Gopal Roy