Goals

The overall aims of the course are:

- To develop students' knowledge of current methods to produce steels and base metals from natural ores and recycled materials with focus on steel, which are most relevant for the Swedish steel industry. However, the production of aluminum and silicon is also discussed to exemplify the production other metal as well as other production concepts.
- To develop students' individual skills at performing relevant thermodynamic calculations for the extraction of base metals with focus on steel.
- To develop students' individual skills at interpreting the significance of the results of these calculations.

Teachers: Pär Jönsson, parj@kth.se
Andrey Karasev, karasev@kth.se
Jesse Franklin White, jfwhite@kth.se

Assistants:

Course requirements: Exam (TEN1), 4 p.
Home assignment (ÖVN1: 2p)
Computer lab "Steel production", participation and written report (lab information will be upload close to lab date).

Literature: Chapters on thermodynamic and ironmaking, steelmaking, ladle refining, production of aluminum and silicon are available on the canvas system.

Period: 1

Exam: October 19, 8.00-13.00, Digital

Re-Exam: December 15, 8.00-13.00, Digital

Student office, ITM
Brinellvägen 68
100 44 Stockholm
Phone: 08-7908200
e-mail: expnord@itm.kth.se

Lecture and exercise schedule

24/8	13.15-15.00	Digital	Course introduction. L1. Extractive metallurgy	– Andrey Karasev
24/8	15.15-17.00	Digital	L2. Basic thermodynamic. Enthalpy, Entropy, Gibbs Energy	– Jesse White
25/8	08.15-10.00	Digital	L3. Basic thermodynamic. Chemical Reaction Equilibria	– Jesse White
25/8	13.15-15.00	Digital	L4. Basic thermodynamic. Phase Equilibria	– Jesse White
27/8	8.15-10.00	Digital	E1. Recitation, exercises	– Jesse White
31/8	13.15-15.00	Digital	L5. Blast furnace metallurgy	– Andrey Karasev
03/9	08.15-10.00	Digital	E2. Recitation, exercises	– Jesse White
07/9	13.15-15.00	Digital	L6. Sulfur removal from iron. Converter metallurgy	– Andrey Karasev
10/9	08.15-10.00	Digital	E3. Recitation, exercises	– Andrey Karasev
14/9	13.15-15.00	Digital	L7. Electric arc furnace metallurgy	– Andrey Karasev
17/9	08.15-10.00	Digital	L8. Ladle metallurgy	– Andrey Karasev
21/9	13.15-15.00	Digital	L9. Ladle metallurgy and casting	– Andrey Karasev
24/9	08.15-10.00	Digital	E4. Recitation, exercises	– Andrey Karasev
29/9	13.15-16.00	M102	Computer laboration	
01.10	8.15-10.00	Digital	L10. Production of aluminium and silicon - Pär Jönsson	
05.10	13.15-15.00	Digital	E5. Recitation, exercises	– Andrey Karasev
08/10	8.15-10.00	Digital	L11. Summary. Example of exam	– Andrey Karasev
19/10	08.00-13.00	Digital	Examination	
15.12	8.00-13.00	Digital	Re-examination	