Goals

The course provides knowledge of:

1. Sustainable business and conditions for a circular economy

2. Materials and available resources (metals, ceramics, minerals, polymers and organic materials)

3. Natural raw materials. Exploration and environmental impact (metals and minerals)

4. Processing and recycling of materials (all materials)

5. Design, manufacture and use in a circular economy (all materials)

6. Recycling and reuse (polymers, ceramics, organic materials and metals)

After passing the course, the student should be able to fulfill the following learning goals:

- LG1: Explain the different principles of circular economy and apply them to different materials.(PRO1)
- LG2: Explain how properties of different processes and different materials contribute to a circular economy. (PRO1 + PRO2)
- LG3: Analyze how changes in processes and / or materials composition affect sustainability goals and the conditions for a circular economy. A perspective includes technical, organizational as well as society's perspective. For higher grades, the student is required to adapt the analysis to the context of the problem. (PRO2)
- LG4: Demonstrate the ability to independently solve problems, as well as the ability to present the solution orally and in writing. (PRO2)

Teachers:
Pär Jönsson, parj@kth.se
Peter Samuelsson, petersam@kth.se
Andreas Feldman, andreas.feldmann@indek.kth.se
Carl Moser, cmoser@kth.se
Minna Hakkarainen, minna@kth.se
Mari Lundström, mari.lundstrom@aalto.fi

Assistant:
Samina Gulshan, saminag@kth.se

Course requirements:

- PRO1 - Seminar assignments, 1,5 credits, grading scale: P, F

- PRO2 - Project assignment, 6,0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

The examiner, in consultation with the KTH Disability Coordinator (Funka), decides on any adapted examination for students with documented permanent impairment.

The examiner may grant another examination form for reexamination of single students.

Literature:
Course material is available in CANVAS

Period: 4 1

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

Lecture, seminar and project schedule

Note that all lectures will be given in the blue room M131 at Brinellvägen 23, if not another specific room is assigned for a lecture.
In addition, his course will be run in hybrid format so that all lectures will be held on zoom https://kth-se.zoom.us/j/62027712531 .

We demand a **mandatory participation** at two **seminars** as well as a case work, which will be expalined in the first lecture. We require a 80% attendance at the lectures. You must write a summary of the contents of the lecture you miss, if you do not have a 80% attendance (based on slides and reading material) of approximately 300 words.

Mo Mar 18 13.15 – 15.00
Course introduction – Pär Jönsson

We Mar 20 10.15 – 12.00
Development of the circular economy – Andreas Feldman

Th Mar 21 08.15 – 10.00,
Metals in a circular economy – Pär Jönsson

Fr Mar 22 8.15 – 12.00
Project work, no class room

Fr Mar 22 15.15 – 16.00
Project supervision, all supervisors, no class room

Mo Mar 25 13.15 – 15.00
Sustainable business and conditions for a circular economy – Peter Samuelsson

Tu Mar 26 13.15 – 15.00, **B21**
Development of different methods to produce green iron/steel – Peter Samuelsson

We Mar 27 15.15 – 16.00
Project supervision, all teachers, no class room

We Apr 10 08.15 – 12.00, **B26**
Half-time seminar project work – all teachers

We Apr 10 13.15 – 15.00
Cellulose in a circular economy – Carl Moser

Th Apr 11 13.15 – 15.00,
Circular economy of batteries – Mari Lundström

Fr Apr 12 8.15 – 12.00
Project work, no class room

Mo Apr 15 13.15 – 15.00
Polymers in a circular economy – Minna Hakkarainen

We Apr 17 10.15 – 11.00
Project supervision, all teachers, no class room

Fr Apr 19 8.15 – 12.00
Project work, no class room

We Apr 24 15.15 – 16.00
Project supervision, all teachers, no class room

Fr Apr 26 8.15 – 12.00
Project work, no class room

We May 22 08.15 – 12.00, B21
Seminar