

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
 - a. Exploration and environmental impact (metals and minerals)
 - b. Mining 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)
- 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

Weihong Yang, weihong@kth.se

Carl Moser, cmoser@kth.se

Minna Hakkarainen, minna@kth.se

Mari Lundström, mari.lundstrom@aalto.fi

Per Storm, per.a.storm@gmail.com

Assistant:

Samina Gulshan, saminag@kth.se

Course requirements:

- PRO1 - Seminar assignments, 3.0 credits, grading scale: P, F
- PRO2 - Project assignment, 4.5 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: 1

Student office, ITM

Brinellvägen 68

100 44 Stockholm

Phone: 08-7908200

e-mail: expnord@itm.kth.se

Lecture, seminar and project schedule

Mo Aug 28 14.15 – 15.00, B23
Course introduction – Andreas Feldman

Tu Aug 29 10.15 – 12.00, B21
Development of the circular economy – Andreas Feldman

Mo Sep 4 13.15 – 15.00, B21
Sustainable business and conditions for a circular economy – Peter Samuelsson

We Sep 6 15.15 – 16.00
Project supervision, all supervisors, no class room

Fr Sep 8 8.15 – 12.00
Project work

Th Sep 14 13.15 – 15.00, B24
Half-time seminar project work – all teachers

Fr Sep 15 8.15 – 12.00
Project work

Mo Sep 18 10.15 – 12.00, D42
Metals in a circular economy – Pär Jönsson

Mo Sep 18 13.15 – 15.00, B21
Cellulose in a circular economy – Carl Moser

Tu Sep 19 15.15 – 16.00
Project supervision, all teachers, no class room

We Sep 20 13.15 – 15.00, B25
Circular economy of batteries – Mari Lundström

Fr Sep 22 8.15 – 12.00
Project work

Mo Sep 25 13.15 – 15.00, B21
Energy in a circular economy for materials processing – Weihong Yang

Tu Sep 26 10.15 – 12.00, B22
Circular economy- HYBRIT – Ulf Spolander

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

**Department of Materials Science and Engineering, Division of Processes, KTH,
Circular Economy for Materials Processing, 7,5 hp (MH2051)**

Fr Sep 29 8.15 – 12.00
Project work

Fr Sep 29 13.15 – 15.00, B25
Polymers in a circular economy – Minna Hakkarainen

Mo Oct 2 13.15 – 15.00, B23
Circular economy for mines and meltshops – Per Storm

We Oct 4 15.15 – 16.00
Project supervision, all teachers, no class room

Fr Oct 6 8.15 – 12.00
Project work

Mo Oct 9 13.15 – 17.00, L44
Seminar