



CIRCUMET

Advanced School on Circular Metal Components for the Swedish Manufacturing Industry



JÖNKÖPING UNIVERSITY



CHALMERS
UNIVERSITY OF TECHNOLOGY



HÖGSKOLAN VÄST



Take the lead in advancing climate action within the metal component manufacturing industry! Taking cutting-edge courses at an advanced level, you elevate your skills and empower yourself to make a significant impact on the movement towards a greener industry. The CIRCUMET courses are designed to deliver a transformative learning experience, integrating flexible pedagogical methods and custom admission processes for industry professionals.

CIRCUMET is a joint effort (2023-2029) where experts from The School of Engineering at Jönköping University, Chalmers University of Technology, University West, and RISE, engage in state-of-the-art competence development for the Swedish industry, together with 15 industrial partners. The first batch of courses will be launched in September 2025. Stay updated for course information and application deadlines by signing up at www.ju.se/circumet

Course themes and planned courses

Circularity

- Science of remelting*
- Material development for circularity and future trends*
- Component design for disassembly and recyclability*
- Introduction to Sustainability and Circularity
- Applied Life Cycle Analysis (LCA)

High-Performance materials and components

- Metallurgy of cast alloys
- Assessment and analysis of recycled materials and components
- Modelling and simulation for circular metal component manufacturing
- Design for minimal material utilization
- Functional materials selection and product innovation

Energy and resource-efficient manufacturing technology

- Sustainable manufacturing for metal components*
- Data analysis-led process optimization
- Introduction to principles of Industry 4.0 & 5.0

*Courses starting Autumn 2025

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IMPORTANCE

Particularly in Sweden, the manufacturing industry is considered the backbone of the economy, with more than 13% contribution to the GDP, and the metal component manufacturing industry is among the top sectors. Yet, within the EU, the manufacturing sector has an outsized impact on the environment, with around 20-25% direct greenhouse gas emissions.

On the other hand, there are very limited and, in most cases, scattered educational packages related to climate action in the metal component manufacturing industry. CIRCUMET highlights the urgency and importance of developing tailored and flexible competence supply in both academia and industry to fight climate change effectively in the metal component manufacturing sector.

EXPECTED RESULTS

The effort covers the circularity and sustainability in the entire value chain of metal component manufacturing; from component design optimization to manufacturing processes, material selection, and even after the component lifetime. Important topics such as Digitalization, Life cycle analysis, and Business models in circular metal component manufacturing are embedded within the CIRCUMET courses.

This is in line with many industrial sectors' commitment to the business ambition for a 1.5°C goal, which targets a climate-neutral and circular business by 2040. The Swedish "Riksdag" also has a clear goal in this regard: by the latest 2045, Sweden must have no net emission of greenhouse gases to subsequently achieve negative emissions.



Academic Partners: School of Engineering at Jönköping University, Chalmers University of Technology, University West, RISE

Industrial Partners: Volvo Cars, Scania CV, Stena Metal International, GKN Aerospace Sweden, Sandvik Coromant, AGES Industri, OVAKO, Comptech, Husqvarna Group, Fagerhult, Gjuteriföreningen, Jernkontoret, Svenskt Aluminium, FKG, Tunga Fordon

Duration of the project: 2023 – 2029

Project management:

Ehsan Ghassemali, Project Leader, JU

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