

Metal Extraction and Recycling (E065471)

Due to Covid 19, the education and assessment methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size *(nominal values; actual values may depend on programme)*

Credits 3.0

Study time 90 h

Contact hrs

30.0h

Course offerings and teaching methods in academic year 2021-2022

A (semester 2)

English

Gent

lecture: plenary exercises

5.0h

lecture

15.0h

seminar

5.0h

excursion

5.0h

Lecturers in academic year 2021-2022

Vervynckt, Stephanie

TW11

lecturer-in-charge

Offered in the following programmes in 2021-2022

[International Master of Science in Sustainable and Innovative Natural Resource Management](#)

3

A

[Master of Science in Chemical Engineering](#)

3

A

[Master of Science in Chemical Engineering](#)

3

A

[Master of Science in Materials Engineering](#)

3

A

[Master of Science in Sustainable Materials Engineering](#)

3

A

Teaching languages

English, Dutch

Keywords

Metal extraction, pig iron, steel, copper, lead, zinc, environmental issues, recycling

Position of the course

Acquirement of insight in the problem areas and the potential of recycling of metals in general. Acquirement of insight in the production process of diverse non-ferrous metals (copper, lead, precious metals). Acquirement of insight in the basic building stones of a metallurgical flowsheet (applied thermodynamics, leaching and precipitation, explosion limits, solvent extraction, ion exchange, biometallurgy, electrometallurgy). Continuously linking the principles with industrial applications and reality. Acquirement of know how in the field of flow sheet design of metal production processes.

Contents

- Introduction: Recycling of complex waste streams
- Pyrometallurgy: production of Cu and Pb: thermodynamics and technologies
- Hydrometallurgy: basic principles and industrial application
- Elektrometallurgy en biometallurgy: basic principles and industrial application
- Flowsheet design: General rules for the design of a flowsheet
- Knowledge management

Initial competences

Materiaalkundige Thermodynamica

Final competences

- 1
- 2
- 3

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Lecture: plenary exercises, Seminar, Excursion, Lecture

Learning materials and price

Syllabus #Winningsmetallurgie & recyclage van metalen#.

References

- F. Habashi, #Handbook of extractive metallurgy#, Wiley, 1997 (ISBN 3 527 28792 2)
- Extractive metallurgy of Copper 5th Edition, 2011. Authors: Mark E. Schlesinger, Matthew J. King, Kathryn C. Sole, William G. Davenport.

Course content-related study coaching**Assessment moments**

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Written examination, Oral examination

Examination methods in case of periodic assessment during the second examination period

Written examination, Oral examination

Examination methods in case of permanent assessment

Report

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible in modified form

Extra information on the examination methods

During examination period: oral closed-book exam, written preparation. During semester: graded lab sessions (preparation, participation, report)

Calculation of the examination mark

30% NPE: Practical (preparation + reporting practical)

70% PE: Examen written & oral – 3 parts (pyro, hydro elektro)