GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2017-2018

Resource Recovery Technologies (I002171)

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

Credits	5.0	Study time	150 h
Contact hrs	60.0 h		

Course offerings and teaching methods in academic year 2018-2019

A (year)	English	guided self-study	15.0 h
		group work	10.0 h
		lecture	35.0 h

Lecturers in academic year 2018-2019

Hennebel, Tom	LA25	lecturer-in-charge
Bertau, Martin	FREIBE	co-lecturer
De Gusseme, Bart	LA25	co-lecturer
Du Laing, Gijs	LA24	co-lecturer
Frisch, Gero	FREIBE	co-lecturer

Offered in the following programmes in 2018-2019	crdts	offering
International Master of Science in Sustainable and Innovative Natural Resource Management	5	A

Teaching languages

English

Keywords

resource, recovery, recycling technology, waste

Position of the course

This course is structured around the “metallurgical toolbox”. This toolbox contains a range of novel and more established technologies that may be integrated into process chains to be set up for recovery of (mineral) resources from solid and liquid wastes and secondary resources.

Contents

The toolbox is constructed based on four typical, subsequent steps in metallurgical flowsheets. In each of the steps, different metallurgical tools will be discussed:
1. Pretreatment
2. Metal extraction: hydrometallurgy, bioleaching, solvo-metallurgy and pyrometallurgy
3. Metal recovery: electrowinning, biosorption/bioprecipitation, physicichemical separations
4. Residue valorization

For each tool, the relevant thermodynamic modelling will be discussed.

Initial competences

The requested initial competences for entering the SINREM MSc programme

Final competences

1 capable to comprehend the engineering principles of the (unit) processes covered in the course
2 can evaluate a technical description of a waste treatment system/installation
3 able to specify the requirements which a waste treatment installation needs to fulfil
4 has insights in the potential use of the different processes when designing technologies for recovery of resources from waste
5 By going through the (online) learning materials offered within the different elements of the toolbox, students will be able to gain basic/general knowledge on the

mechanisms behind the different technologies, their working principles, their potential applications, boundary conditions for their use, their (dis)advantages, economic aspects, environmental impact, etc. The learning materials should allow students that have at least a bachelor degree in a broad range of scientific disciplines (e.g., chemists, bioscience engineers, civil engineers, geologists,...) to become familiar with the technologies involved.

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

Guided self-study, group work, lecture, microteaching, on-line discussion group, project, research project

Learning materials and price

References

Course content-related study coaching

Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination

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

Written examination

Examination methods in case of permanent evaluation

Oral examination, report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

Calculation of the examination mark

Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.