



Cursusomvang (nominale waarden; effectieve waarden kunnen verschillen per opleiding)

Studiepunten 3.0 Studietijd 90 u Contacturen 30.0 u

Aanbodssessies en werkvormen in academiejaar 2019-2020

A (semester 2) Engels hoorcollege 20.0 u
werkcollege: geleide oefeningen 10.0 u

Lesgevers in academiejaar 2019-2020

Rabaey, Korneel LA25 Verantwoordelijk lesgever
Mangelinckx, Sven LA24 Medelesgever

Aangeboden in onderstaande opleidingen in 2019-2020

[Bachelor of Science in Environmental Technology](#) stptn 3 aanbodsessie A

Onderwijstalen

Engels

Trefwoorden

Non-food applications, renewable resources, green chemistry, chemical modification, bioenergy, biosolids, critical metals.

Situering

Renewable Resource Technology is about of the use/reuse and/or the chemical modification of side-streams and raw materials from urban, industrial and agricultural activity. The emphasis of the course is on applications with added value as well as on applications enabling loop closure. The coverage of the renewable resources takes into account the availability, the environmental impact and the ecological conditions.

Inhoud

1. The interest in renewable resources and principles of green chemistry
2. Use of carbohydrates in non-food applications
3. Use of proteins in industrial applications
4. Natural fibers
5. Use of lipids in industrial applications
6. Recovering organics for agriculture with composting
7. Anaerobic digestion: principles and technology
8. Metal removal and recovery from solid and aqueous waste
9. Emerging topics in microbial reuse

Begincompetenties

*A basic knowledge of organic chemistry and general microbiology is required, as well as basic knowledge on wastewater and waste treatment.
Renewable Resource Technology builds on certain learning outcomes of course units 'Organic Chemistry 1: Structure and Reactivity' (O000082) and 'Organic Chemistry 2: Advanced Reactivity' (O000092); or the learning outcomes have been achieved differently.*

Eindcompetenties

- 1 *Having insight in the chemical principles of industrial modification processes of renewable resources*
- 2 *Having insight in the importance of chemically modified renewable resources*
- 3 *Having insight in the origin and processing of renewable resources*
- 4 *Have insight and knowledge about the connectivity and the multidisciplinary character of the taught subjects*

- 5 *Understanding the potential of harnessing microorganisms for the recovery of resources*
- 6 *Understanding the building blocks needed for circular resource management from a technology perspective*

Creditcontractvoorwaarde

Toelating tot dit opleidingsonderdeel via creditcontract is mogelijk mits gunstige beoordeling van de competenties

Examencontractvoorwaarde

Dit opleidingsonderdeel kan niet via examencontract gevolgd worden

Didactische werkvormen

Hoorcollege, werkcollege: geleide oefeningen

Toelichtingen bij de didactische werkvormen

Theory: oral lectures, seminars

Exercises: guided sessions

Leermateriaal

A syllabus (in English) is available which can be bought or downloaded from the course website. The slides in English are made available electronically.

Referenties

C. V. Stevens, R. Verhé : Renewable Bioresources, Scope and Modification for Non-Food Applications, Wiley, London (2004) (ISBN : 0-470-85447-2)

Chapter 15 Fats and Oils in H. A. Wittcoff, B. G. Reuben, J. S. Plotkin: Industrial Organic Chemicals, Third Edition, Wiley, ISBN 9780470537435, 2013

Chapter 16 Carbohydrates in H. A. Wittcoff, B. G. Reuben, J. S. Plotkin: Industrial Organic Chemicals, Third Edition, Wiley, ISBN 9780470537435, 2013

Tchobanoglous, G., Burton, F. and Stensel, H.D. (2002) Wastewater engineering: treatment and reuse, Metcalf & Eddy.

Vakinhoudelijke studiebegeleiding

Close contacts via contact hours or via electronic appointment with the lecturers.

Evaluatiemomenten

periodegebonden evaluatie

Evaluatievormen bij periodegebonden evaluatie in de eerste examenperiode

Schriftelijk examen met open vragen, schriftelijk examen

Evaluatievormen bij periodegebonden evaluatie in de tweede examenperiode

Schriftelijk examen met open vragen, schriftelijk examen

Evaluatievormen bij niet-periodegebonden evaluatie

Tweede examenkans in geval van niet-periodegebonden evaluatie

Niet van toepassing

Eindscoreberekening

Part on Renewable Resource Technology: chemical modification: period aligned evaluation (50% of final mark)

*Part on biological processes 50% of mark, of which 2/3 theory and 1/3 exercises
Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.*