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

Course Specifications
Valid as from the academic year 2020-2021

Sustainable Materials (I630050)

Course

Lecturers in academic year 2020-2021
Dumoulin, Ann
LA24 lecturer-in-charge

Course offerings and teaching methods in academic year 2020-2021
A (semester 2) (language of instruction unknown)
Kortrijk
- seminar: coached 4.0 h
- exercises
- excursion 10.0 h
- practicum 16.0 h
- lecture 20.0 h

Offered in the following programmes in 2020-2021
Bachelor of Science in Bioindustrial Sciences

Credits 5.0 Study time 150 h Contact hrs 50.0 h
Course size (nominal values; actual values may depend on programme)

Teaching languages
Dutch

Keywords
Sustainable materials, biomaterials, bioplastics, bioplastics processing, (bio-)composites, recycling

Position of the course
The course gives an overview of sustainable materials, different types of bioplastics compared to petroleum-based plastics, the polymerization processes, additives and processing techniques for bioplastics. Recycling plastics and (bio-)composites are included in the course.

Contents

Theory
- biomaterials: paper, wood (pellets), bioplastics
- Introduction and sustainability of (bio-)plastics
- Bioplastics (biodegradable, biobased and recycled plastics)
- Polymerization processes
- Additives for (bio-)plastics
- (Bio-)plastics processing
- Physicochemical characterization of (bio-)plastics
- biocomposites
- Applications of bioplastics and bioplastic labels
- Waste treatment of (bio-)plastics: composting (organic), recycling (mechanical, chemical), incineration with energy recovery

Lab (some examples)
- synthesis: polylactic acid
- properties: determination of molecular mass (Ubbelohde viscometer)
- recycling: flotation separation of plastics
- biodegradation screening test

Excursion:
Guided visits of companies active in the domain of sustainable materials or synthesis and processing of bioplastics

(Approved)
Initial competences
The course builds on certain learning outcomes of the course units ‘Organic Chemistry 1’ and ‘Organic Chemistry 2’

Final competences
1. The student has a thorough knowledge and understanding of the concepts of sustainable materials and bioplastics, additives used, properties and processing
2. The student has practical experience (team work) with laboratory scale synthesis, physical and chemical characterization of bioplastics, separation of plastics and the biodegradability
3. The student can independently search for scientific and technical information (scientific literature, application notes, standards), communicate about the methods and the results in a written report and oral presentation
4. The student has awareness for the sustainable and safe use of the materials

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
Excursion, lecture, practicum, seminar: coached exercises

Extra information on the teaching methods
lectures with powerpoint presentation and coached exercises
hands-on labs in small groups
guided excursions to companies
the students write a paper on a sustainable material which covers all aspects of the course

Learning materials and price
Dutch course practicum notes
additional information on the digital learning environment

References
see course text

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 with open questions, oral examination, assignment

Examination methods in case of periodic evaluation during the second examination period
Written examination with open questions, oral examination, assignment

Examination methods in case of permanent evaluation
Participation, assignment, report

Possibilities of retake in case of permanent evaluation
evaluation during the second examination period is possible in modified form

Extra information on the examination methods
Periodic evaluation: written preparation of examination with open questions and exercises followed by oral discussion, project review
permanent evaluation: evaluation of attitude, knowledge, technical skills and communication skills during the hands-on lab sessions

Calculation of the examination mark
First examination period:
periodic evaluation (theory): 50%
permanent evaluation: 50%
Students who eschew (part of) non-periodic aligned evaluation for this course may be failed by the examinor.

Second examination period:
periodic evaluation (theory): 50%
permanent evaluation: 10% lab exam, 40% score from the first examination period

(Approved)
In order to pass, one has to attain a total score of 8/20 for both periodic and permanent evaluation. If this condition is not fulfilled, and when the calculated score is 10/20 or more, the student may be failed by the examiner and gets a score of 9/20. This applies for both periods.