

BOVA Intensive MSc Course

Application of Circular Economy Principles in Landfills

16th-20th April 2018

3 ECTS (pass/no pass)

Venue: Paikre Sanitary Landfill in Pärnu, Estonia

Max 20 students

Please sign up [HERE](#) until 23.03.2018

Course description

Circular Economy is becoming a backbone for Waste Management in EU. It is to extract the maximum benefits from materials and to generate the minimum load to the environment. The application of waste management hierarchy will help to prevent emissions of greenhouse gases, reduce pollutants, save energy and resources, create jobs and stimulate the development of green technologies. Even if the role of sanitary landfills will be minimised in the future, they will still remain as important part of waste management infrastructure.

Aim of this course is to demonstrate, that it is possible to apply the principles of Circular Economy also within one individual landfill, thus minimising its environmental footprint, reducing demand for virgin construction materials, and creating local jobs in emerging waste-to-product business. The rationale of the course is to provide students with understanding about how the sanitary landfills should implement alternative treatment methods within legal and safety regulations, and as ultimate objective, attempt to use 100 % of renewal energy and recycled materials in all activities within landfill itself.

BOVA Intensive MSc Course will consist of two parts:

1. **Distance learning 2nd – 15th April, 2018.** Every student will prepare a review on one given waste type. Student will get his/her waste type after confirmation about participation;
2. **Meeting in person 16th – 20th April, 2018,** will entirely take place at a sanitary landfill site, Pärnu, Estonia (<http://paikre.ee/>). During meeting in person the students will:
 - Witness how a modern Sanitary Landfill and waste sorting facility functions;
 - Gain a work experience at a waste sorting facility;
 - Study waste processing technologies;
 - Learn waste composition and study basic properties of waste fractions by experience;
 - Estimates quality of individual waste fractions;
 - Learn about waste-to-product concepts and aspects of Circular Economy;
 - Learn basic remediation methods of contaminated soils;

Final assignment will be publicly presented in five groups. Each group will propose a particular chapter for a 'Master Plan of a sustainable Sanitary Landfill 2030'. Combining academic teaching with daily activities in a large functional landfill & waste recycling facility is rare and innovative.

Financing: There is no participation fee. All participants need to cover their transport to/from Estonia and accommodation in Pärnu (EMÜ will book rooms for all participants). All lunches and the icebreaking party are paid by EMÜ. NOVA/BOVA students should contact their local NOVA/BOVA coordinators for

funding options for travel and accommodation (Nordplus Express Mobility Grant). EMÜ is not offering any scholarships, non BOVA-NOVA students are advised to seek for alternative funding.

Teaching team:

- Estonia: Estonian University of Life Sciences (EMU) – prof Mait Kriipsalu; assoc. prof Kaja Orupõld, prof Valdo Kuusemets.
- Latvia: Latvia University of Agriculture (LLU) – assoc. prof Inga Grinfelde.
- Sweden: Linnaeus University (LNU) – prof William Hogland.
- Germany: RWTH Aachen University (RWTH) – prof Thomas Pretz.

Lecture topics:

EU legislation and Circular Economy.

Future of landfills in conditions of Circular Economy.

Sorting of materials: what machines can do?

End-of-waste approach.

Certification of waste products.

Composting of biowaste.

Contaminated soils and remediation of soil.

Landfill as material bank.

Landfill Mining & landfill remediation.

Learning and testing measurement equipment.

Practical information about stay in Pärnu

Indoor activities will take place at seminar room of Pärnu Sanitary Landfill.

Coffee, tea and snacks will be made available in seminar room.

Lunch will be provided, based on local school.

Bus 20 persons + few cars will be available to provide transportation.

Site visits and cultural event is included.

Working boots and overall can be changed and stored at landfill site.

There is a changing room for ladies and gents.

Bring your own safety boots and safety glasses. Select appropriate clothes and hat. Consider landfill odours and weather conditions.

Will be provided: safety vest, gloves, helmet, aprons.

Information: prof Mait Kriipsalu, mait.kriipsalu@emu.ee

Programme

Sunday, April 15

Arrival to Pärnu via Tallinn or Riga airports, or Tallinn ferry terminal. Bus trip to Pärnu. Accommodation.
Evening: Icebreaking. Introducing students and lecturers.
Introduction to the study week – how do we work?
Introducing Estonia, Pärnu, Tartu, and Estonian University of Life Sciences.
Safety instructions

Monday, April 16

08.00. Departure from Hotel/Hostel by bus.
08.30–10.00. Study visit to Pärnu sorting facility.
10.00–11.30. Study visit to Pärnu biomass boiler house.
11.30–13.00. Trip to Pärnu landfill & Lunch
13.00–15.00. Intro to Pärnu Landfill. Waste walk. Current recycling of materials, packaging waste, sorting lines, composting of biowaste and sludge, gas and leachate collection, landfill infrastructure.
15.15–16.30. Lectures
16.30–17.00. Workplan for final assignment. Basic instructions.
17.00. Summary of the day. Task for next day. Bus to hostel.
19.00. Cultural event

Tuesday, April 17

08.00–08.30. Departure from Hostel. Trip to Pärnu landfill. Getting organised.
9.00–12.00. Practical exercise: sorting of waste to determine composition of municipal waste in Pärnu. Parallel group work with three different tasks. Sampling & weighing all fractions.
12.00–13.00. Lunch
13.00. Data analyses, filing and saving data.
15.00–17.00. Lectures
17.00. Summary of the day. Task for next day. Bus to hostel.

Wednesday, April 18

08.00–8.30. Departure from Hostel. Trip to Pärnu landfill. Getting organised.
9.00–12.00. Three tasks. All these tasks will be performed in groups of 6 to 7 students, and these groups will be rotating. Duration of rotation 1 h each: a) Working on sorting belt. Each student is supervised by a skilled person; b) Table-sorting of fine fraction; c) Upgrading quality of materials by washing.
12.00–13.00. Lunch
13.00–14.00. Filing and saving data
14.00–17.00. Lectures
17.00. Summary of the day. Task for next day. Bus to hostel.

Thursday, April 19

08.00–8.30. Departure from Hostel. Trip to Pärnu landfill.
09.00–12.00. Lectures
12.00–13.00. Lunch
13.30–15.00. Lectures
15.30–17.00. Individual work, data management, preparation of assignment.
17.00. Bus to hostel.

Friday, April 20 (clean day)

08.00–8.30. Departure from Hostel. Trip to Pärnu landfill.
09.00–12.00. Presentation of student assignments in 5 groups.
12.00–13.00. Lunch.
14.00. End of the courses. Summary, feedback.
Bus to hostel.

Saturday, April 21

Departure of all students and staff.