



SHORT COURSE CERTIFICATE Reference 2105

Name of the course	Plastic recycling - Current state and chances (Tái chế nhựa- Hiện trạng và cơ hội)	
Contact person	first name	Hung Anh
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Workload for participants	8 days	
Learning Outcomes (LO)	<p>After attending this course, participants</p> <ul style="list-style-type: none"> - have a basic understanding how plastic materials are produced, which properties they can have and how plastics are identified and analysed; - are able to explain the recycling chain with collection, sorting and processing; - recognize technologies in sorting and in processing of plastic waste; - are able to characterize processes for the recycling of other recyclables and disposal of residues. 	
Target groups	Enterprises, Agency, government group	
Prerequisites	none	
Description of the course	<p>This course provides basic information about the life cycle of plastic materials. The main processes in primary production of plastics such as extrusion, moulding, and calendaring, are described and plastic markets are analysed. Material properties in terms of physical and mechanical properties are given. Major procedures for the identification of polymers and analytical procedures are explained. As recycling is built on a chain of processes (collection – sorting – processing), waste collection schemes are explained. Incentives for the separate collection to motivate users are explained. For sorting of plastic waste, technologies such as magnetic and electrostatic separation, screening, density separation, and optical sorting are shown; a case study of a sorting plant gives further details. For the follow up processing, typical recycling technology such as granulation, washing, drying, and extrusion are given to explain material recycling. A case study of a PET recycling facility gives more details. To enable a better understanding of the context of plastic recycling, the processing of recyclables such as waste paper, glass, metals, organic waste and electronic waste is explained. As a technology to treat residues and mixed waste, the technology of thermal waste treatment is shown.</p>	
Overview of the syllabus	<ul style="list-style-type: none"> - Primary production of plastics, (ppt slides) - Plastic properties and analysis (ppt slides) - Plastic properties and analysis, sample preparation (video) - Plastic properties and analysis, XRF (video) - Plastic properties and analysis, FTIR (video) - Waste collection (ppt slides) - Waste collection, shredding and milling (video) - Waste collection, TOC (video) - Waste collection, waste sorting and sampling (video) - Waste collection, heating value (video) - Waste collection, elution (video) - Waste collection, case study: waste transfer station Ho Chi Minh City (Photos) - Plastic waste sorting (ppt slides) - Plastic waste sorting, Plastic recycling plant Vientiane, Laos (Video) - Plastic waste sorting, Plastic recycling plant Vientiane, Laos (Photos) - Plastic waste sorting, Magnetic separator (Video) 	



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	<ul style="list-style-type: none">- Plastic waste sorting, Ballistic separator (Video)- Plastic waste sorting, Near Infrared Spectroscopy (Video)- Plastic waste sorting, Plastic sorting facility in Lower Austria (Photos)- Plastic waste sorting, Plastic sorting facility in Dresden (Photos)- Plastic waste sorting, Visit of 26.3 cp.ltd (Video)- Plastic waste sorting, Visit of Linh Chien Company (Video)- Plastic waste sorting, Visit of Plastic Recycling Plant in Hanoi (Video)- Plastic waste sorting, Visit of Craft Village in Vietnam (Video)- Plastic waste sorting, Wongpanit Company (Video)- Plastic waste recycling technology (ppt slides)- Processing of recyclables (ppt slides)- Thermal treatment and energy recovery (ppt slides)
Teaching and learning methods	The first module, teacher give general information about plastic industrial. In the second and third module, teacher use PBL to express the teaching material.
Assessment of LO	The first module: Discussion of the given topics. The second module: Every group came up with ideas for opportunity to develop bioplastics in Vietnam The third module: Every group came up with ideas for the plastic recycling
Trainer	<ul style="list-style-type: none">• Prof. Le Hung Anh• Dr. Nguyen Thi Thanh Truc• MSc. Do Doan Dung• Dr. Nguyen Thi Lan Binh• MSc. Nguyen Trung Hoang

Reviewer 1	Prof. Dr.-Ing. Kerstin Kuchta, Technical University Hamburg
Reviewer 2	Prof. Dr. Sengprasong Phrakonkham, National University of Laos
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Vienna, 2021-04-14

Dr. Gerhard Schleining

