GENERAL INFORMATION					
Subject name	TR1. Sustainable & Lean Manufacturing				
Semester	1	Character	Compulsory	Type of module	Transversal
ECTS	3		Modality	On line	
Higher Education Institution(s)			KUT, ESTIA		
Lecturer(s)			Błażej Bałasz Iban Lizarralde Laura Laguna		

LEARNING AND TEACHING	
ESCO Occupation(s)	Manufacturing engineer
ESCO Skill & Competences (*no ESCO)	Sustainable manufacturing Lean manufacturing Assess environmental impact Environmental management standards
Learning outcomes (meaning of the acronyms in Annexe 4)	KU2, EP3, EP4, IN2
Teaching methods	Lectures Case studies
Assessment methods	Examinations Problem sets and exercises

CONTENTS

Previous requirements (if necessary)

None

Content index

1. Sustainable Manufacturing
   - Environmental Regulations and Compliance
   - Green Manufacturing Processes and Technologies
   - Life Cycle Assessment

2. Lean Manufacturing
   - Lean principles
   - Lean Tools and Techniques
   - Lean Implementation Strategies

3. Circularity
   - Main concepts
   - Impacts on external supply chains
   - Impacts on the flexibility of the company (internal supply chains)

SUPPORTING BIBLIOGRAPHIC REFERENCES

Life Cycle Assessment (LCA): A Guide to Best Practice 1st edition by Klöpffer, Walter, Grahl, Birgit
ISO 14044:2006 specifies requirements and provides guidelines for life cycle assessment

Agarwal, Abhishek. Ecological modernisation and the development of the UK's green industrial strategy: the case of the UK National Industrial Symbiosis Programme. Diss. 2011.
Tukker, Arnold. "Product services for a resource-efficient and circular economy–a review." Journal of cleaner production 97 (2015): 76-91.